



# **MINOR PLANETS**

## **for 1947**

### **Elements and Opposition Ephemerides**

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**1948**

# EPHEMERIDES OF MINOR PLANETS

for 1947

## INTRODUCTION

This volume contains the ephemerides of all numbered Minor Planets for the year 1947. These ephemerides have been computed at numerous centers throughout the world and many of them have received only a limited circulation in some one of several different temporary publications. In order that all the material might be more readily available for easy reference and to provide a wider circulation, it was decided after consultation by correspondence among President Spencer Jones, Secretary Oort, Prof. Brouwer, and Prof. Leuschner that this complete volume should be published under the auspices of the International Astronomical Union.

The interruption of the regular publication of *Kleine Planeten* was seriously felt by all observers. After 1941, very few copies were received in United States. A microfilm copy of the 1944 volume was received by the American Committee for the Distribution of Astronomical Literature. The volumes for 1945 were printed in Halle, Germany, and they were still undistributed by the summer of 1945. Handwritten manuscript for the 1946 volume was received by the U. S. Naval Observatory from Dr. Kopff at Heidelberg through military channels; this was reproduced by direct photolithography and distributed as widely as possible.

In 1946, Prof. E. Delporte, as president of the I. A. U. Commission 20 for Minor Planets, undertook to organize a cooperative enterprise among various European observatories, which would provide some of the needed ephemerides for 1947. These were sent to Berkeley as they became available, and mimeographed copies were generously distributed by Dr. Cunningham. Late in 1946, the Watson Scientific Computing Laboratory, under the direction of Dr. W. J. Eckert, undertook the computation of 783 ephemerides, including all those which were believed not to be provided for elsewhere. About thirty hectograph copies of their results were printed and distributed. The ephemerides computed at the Institute of Theoretical Astronomy at Leningrad were printed in two parts and distributed by Prof. Subbotin. In April, 1947, the ephemerides of 258 minor planets computed by astronomers who were working under the auspices of the National Research Council of Japan were received from Prof. Y. Hagihara through military channels. This project was uncoordinated with any of the above mentioned computations. For the year 1948, the Institute of Theoretical Astronomy at Leningrad has undertaken to prepare all the ephemerides.

All the results which have become available have been collected into this one volume. In order to avoid needless duplicate printing, only one ephemeris has been printed for each object, but the corrections to be applied in order to obtain other ephemerides for the same object have been given in an appendix.

The lithoprinting copy for this volume has been prepared on the electric, card-controlled typewriter of the U. S. Naval Observatory with the cooperation of Mr. G. M. Clemence. Preference was therefore given to the ephemerides of the Watson Laboratory since their results were already available on punched cards. Of the remainder, preference was given to the Leningrad ephemerides since it was believed that in many cases their results included improved orbits and reliable



perturbations. Nearly all of the other computations were based on the elements given at the beginning of this volume, except the Japanese, which were based mostly on the elements of the 1941 *Kleine Planeten*. The ephemerides computed at Yale and some of those computed at Cincinnati contain special perturbations.

The elements on pages 1 to 32 are essentially those of the 1945 *Kleine Planeten*. The values, on punched cards, were provided originally by Dr. Cunningham. They had been taken from the 1944 *Kleine Planeten*, but certain elements were supplanted by values received from Prof. Delporte. The latter values comprised those which were changed in the 1945 *Kleine Planeten* from the preceding year. The customary notation of "A" and "S" to designate the inclusion of absolute or special perturbations in the ephemeris computation has been indicated where it is definitely known. The pages of opposition dates have been arranged in successive vertical columns, each containing the planet number, the month and day of opposition, the magnitude, and the number of the page on which the ephemeris appears.

The opposition ephemerides contain the month and day in the left hand column, followed by the date of opposition. The next columns contain the right ascension, its differences, the declination, and its differences, all for 0<sup>h</sup> UT and referred to the equator and equinox of 1950.0. The right hand column contains miscellaneous data. The first three quantities are the magnitude, the mean anomaly at opposition, and log  $r$ . Next are given either the corrections to the declination and right ascension corresponding to the planet being eight days earlier in its orbit, or the quotient of these two numbers (i.e. the usual variation) followed by a blank line. Finally is given log  $\rho$ , and a code number to signify the place of computation. If the code number is followed by an asterisk (\*) this signifies that duplicate ephemerides were computed, and the corrections to be applied to the printed results in order to obtain the others will be found in the appendix. The appendix contains the planet number,  $\Delta \alpha$ ,  $\Delta \delta$ , and the computer's code.

The places of computation have been coded as follows:

- |                      |                  |                    |
|----------------------|------------------|--------------------|
| 1. Watson Laboratory | 6. Berkeley      | 11. Tortosa (Ebre) |
| 2. Leningrad         | 7. Cincinnati    | 12. Turku          |
| 3. Algiers           | 8. Madrid        | 13. Uccle          |
| 4. Barcelona         | 9. Nice          | 14. Japan          |
| 5. Belgrade          | 10. San Fernando | 15. Yale           |

The following persons are known to have assisted with the computations. 1: Dr. H. R. J. Grosch, Mrs. Hausman, Mrs. Herrick. 2: Mme. N. Samoilova-Jachontova (in charge), N. Boeva, N. Bohan, S. Warzar, D. Koulikov, S. Makover, V. Moskova, V. Oreleskaya, M. Tovstik, F. Hhanina, S. Hhoublarova, M. Shmakova; at Odessa, V. Cessewic, director, O. Kasackovskaya, I. Pelisenko, A. Prihodko, A. Cessulevic; at Riga, K. Steins, director, M. Dirikis, I. Kurzemniece, Kaulins; at Kiev, I. Putilin; at Poulkovo, I. Milstein; at Kharkov, G. Bazenov. 3: L. Boyer, G. Reiss. 4: I. Febrer. 6: L. E. Cunningham (in charge), V. Blanco, Mary Driggers, N. Hanson, Mrs. Phyllis Hanson, Helen Pettit, R. Sill, Marjorie Leite. 7: Paul Herget, Antoinette Kettenacker. 8: R. Carrasco. 9: A. Patry, Mme. Laugier. 12: Y. Vaisala. 13: E. Delporte, S. Arend. 14: I. Ebihara, H. Hirose, T. Hikami, M. Hosino, K. Hurukawa, S. Kanda, K. Kumakiri, T. Matukuma, T. Mori, T. Nisio, M. Nisiyama, T. Takeuti, J. Ueta, I. Ura, I. Watanabe. 15: K. Koziel, J. Torroja, and the Watson Astronomical Computing Bureau.

This volume has been prepared under the supervision of Dr. Paul Herget, Cincinnati Observatory.

## ELEMENTS

1

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$	i	$\phi$	n	a	
	m	m			°	°	°	°	°	"		
1	7.4	4.0	1933	I	1	169.816	70.369	80.675	10.605	4.479	770.715	2.7674
S 2	8.0	4.5	1943	X	15	284.962	310.275	173.039	34.825	13.606	769.950	2.7692
S 3	8.7	5.5	1942	V	9	164.041	245.477	170.702	13.013	14.830	813.203	2.6702
4	6.5	4.0	1857	I	2	196.339	148.275	104.007	7.135	5.074	977.884	2.3613
A 5	9.9	6.9	1900	I	0	337.460	354.300	142.480	5.330	10.930	857.905	2.5766
6	8.5	5.8	1942	X	8	351.352	238.189	138.883	14.753	11.636	939.370	2.4254
7	8.4	5.8	1941	VI	19	97.263	143.702	260.012	5.499	13.311	963.032	2.3855
8	8.9	6.8	1900	I	0	5.680	283.740	111.110	5.895	9.021	1086.222	2.2014
9	8.9	6.3	1858	VII	1	57.218	2.656	69.686	5.603	7.084	962.339	2.3867
S 10	9.5	5.4	1940	IX	4	113.586	306.022	285.770	3.799	6.046	636.285	3.1446
11	9.3	6.5	1925	I	0	79.800	192.964	125.839	4.623	5.774	923.857	2.4524
12	9.7	7.2	1943	XI	12	78.172	67.880	235.775	8.378	12.748	995.519	2.3333
13	9.7	6.7	1933	XI	29	313.810	78.944	43.718	16.594	4.907	857.976	2.5764
A 14	9.7	6.6	1900	I	0	288.400	93.140	87.660	9.120	9.480	852.300	2.5879
A 15	8.6	5.4	1900	I	0	13.530	94.980	294.420	11.760	10.780	825.347	2.6439
16	9.6	5.9	1900	I	0	333.648	224.839	151.194	3.069	7.852	710.136	2.9227
A 17	10.1	7.3	1950	I	0	354.910	136.420	125.300	5.606	7.653	913.252	2.4714
18	9.3	6.9	1854	I	1	80.227	225.056	151.376	10.143	12.572	1020.120	2.2956
A 19	9.8	7.1	1900	I	0	103.180	180.000	211.910	1.545	9.073	929.658	2.4423
20	9.2	6.5	1900	I	0	149.790	253.070	207.620	0.680	8.290	949.232	2.4085
21	10.1	7.4	1853	I	3	74.474	246.841	81.593	3.086	9.329	933.548	2.4355
22	9.8	6.1	1925	I	1	199.095	352.769	67.181	13.740	5.810	714.684	2.9101
23	10.5	7.3	1900	I	0	335.450	56.740	68.460	10.220	13.500	832.792	2.6281
24	10.8	6.7	1874	XII	7	349.813	104.537	36.442	0.815	7.426	639.572	3.1339
25	10.5	7.9	1939	IX	8	23.972	89.622	214.423	21.569	14.807	954.076	2.4004
26	10.5	7.3	1900	I	0	262.970	190.380	47.220	3.600	4.970	819.774	2.6559
27	9.7	7.2	1943	XII	22	353.153	355.599	94.245	1.588	9.925	986.716	2.3472
28	10.1	6.6	1900	I	0	359.069	339.400	145.330	9.380	8.730	766.432	2.7778
29	9.0	6.1	1855	I	1	198.152	59.714	357.790	6.128	4.256	869.033	2.5545
30	9.9	7.4	1942	XII	11	34.203	84.327	309.078	2.103	7.295	975.120	2.3657
31	11.0	6.8	1940	III	6	35.811	63.002	31.276	26.344	12.176	630.538	3.1637
32	10.6	7.5	1900	I	0	154.490	334.100	221.240	5.530	4.790	852.585	2.5873
33	11.8	8.2	1939	II	21	157.614	334.758	9.006	1.906	19.464	729.040	2.8719
A 34	11.5	8.2	1900	I	0	98.020	326.380	185.520	5.460	6.150	805.529	2.6872
35	12.2	8.3	1939	VIII	1	83.505	208.717	355.486	8.084	12.879	684.786	2.9944
36	12.0	8.6	1939	I	15	76.084	45.710	358.958	18.534	17.479	778.317	2.7494
A 37	10.4	7.2	1900	I	0	63.180	59.520	8.460	3.100	10.160	826.042	2.6424
38	11.4	8.0	1900	I	0	262.090	165.560	296.840	6.960	8.830	781.770	2.7413
39	9.5	6.0	1936	XI	12	340.874	206.939	157.489	10.351	6.382	769.978	2.7692
40	9.2	6.9	1934	I	28	120.119	268.136	94.646	4.261	2.651	1039.355	2.2672
41	10.5	7.0	1939	IV	13	348.226	43.390	179.004	15.896	15.842	773.409	2.7610
42	10.4	7.7	1931	I	24	154.008	235.559	84.826	8.550	12.852	929.367	2.4428
43	10.0	7.9	1900	I	0	326.326	13.898	265.453	3.472	9.667	1084.965	2.2032
44	9.8	7.1	1941	VIII	27	229.854	341.812	131.882	3.697	8.556	940.208	2.4239
A 45	10.7	7.3	1900	I	0	192.220	82.820	148.980	6.590	4.720	790.506	2.7211
46	10.6	7.7	1900	I	0	170.810	173.710	181.930	2.290	9.630	883.866	2.5259
47	11.2	7.5	1939	IV	22	281.178	311.963	4.090	4.997	7.441	725.428	2.8814
48	10.9	6.8	1939	VIII	9	243.672	251.931	184.732	6.516	4.332	647.204	3.1092
49	11.0	7.0	1939	XI	7	18.055	105.159	288.590	3.154	13.517	654.764	3.0852
A 50	11.7	8.5	1900	I	0	285.470	196.800	174.500	2.800	16.760	822.280	2.6505

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
S 51	9.8	7.3	1939 VIII	25	136.873	359.570	176.093	9.959	3.805	975.156	2.3657
52	10.3	6.2	1938 XII	21	332.604	340.378	129.478	7.461	6.034	650.353	3.0991
A 53	11.5	8.4	1900 I	0	13.150	309.740	144.460	5.140	11.820	836.960	2.6192
54	10.9	7.6	1900 I	0	117.150	341.780	314.620	11.750	11.360	794.778	2.7113
55	10.8	7.4	1925 I	0	158.355	1.938	11.132	7.221	8.266	773.818	2.7601
56	11.3	8.2	1900 I	0	71.964	100.568	194.754	8.048	13.571	847.184	2.5983
57	10.7	6.5	1940 II	5	89.480	210.847	199.626	15.166	5.779	631.829	3.1594
A 58	11.6	8.3	1865 I	8	21.523	27.864	162.491	5.020	2.439	799.596	2.7004
59	10.9	7.6	1900 I	0	271.470	208.200	171.000	8.610	6.820	793.732	2.7136
60	11.1	8.5	1900 I	0	129.800	267.640	192.620	3.580	10.610	958.329	2.3933
61	11.0	7.1	1942 VI	30	310.095	9.848	334.231	18.243	9.443	688.011	2.9850
62	12.3	8.2	1874 XII	26	185.775	270.705	126.625	2.200	10.292	643.098	3.1224
63	9.9	7.3	1925 I	0	343.460	292.760	338.670	5.790	7.190	957.041	2.3954
A 64	10.5	7.2	1900 I	0	340.880	174.400	311.690	1.330	7.300	807.772	2.6821
S 65	11.0	6.4	1943 II	14	256.934	103.000	156.908	3.499	7.524	563.387	3.4104
66	12.2	9.0	1900 I	0	122.550	40.330	8.960	3.080	9.980	824.213	2.6464
A 67	11.2	8.5	1900 I	0	38.600	103.640	203.650	5.990	10.752	941.800	2.4212
68	10.5	7.0	1939 III	13	167.618	302.301	44.824	7.968	10.632	763.814	2.7841
69	10.7	6.8	1939 V	26	109.622	285.481	186.471	8.534	9.793	690.563	2.9776
A 70	10.9	7.8	1900 I	0	353.620	252.720	48.980	11.640	10.510	839.066	2.6150
71	10.7	7.3	1925 I	0	40.000	265.710	316.850	23.260	10.050	775.750	2.7559
72	11.2	8.9	1913 I	0	309.907	100.421	208.639	5.393	6.945	1039.854	2.2665
A 73	12.0	8.8	1950 I	0	178.620	53.200	7.590	2.400	2.461	815.547	2.6651
74	11.8	8.3	1950 I	0	291.570	172.320	197.580	4.020	13.760	765.523	2.7799
75	11.6	8.4	1900 I	0	211.850	335.660	0.670	5.000	17.707	812.161	2.6725
S 76	12.0	7.4	1940 III	17	66.135	236.674	212.125	2.085	11.214	569.587	3.3856
A 77	11.1	7.9	1900 I	0	154.460	57.820	2.780	2.460	7.640	813.762	2.6689
78	10.6	7.5	1900 I	0	279.980	148.680	334.610	8.690	12.000	835.963	2.6213
79	10.5	7.8	1930 III	31	118.530	199.376	207.241	4.594	11.100	928.333	2.4446
A 80	10.6	8.2	1925 I	1	58.849	137.206	219.409	8.618	11.537	1019.887	2.2961
81	11.8	8.2	1925 I	0	149.020	47.280	2.730	7.920	12.160	735.732	2.8545
82	11.2	7.8	1939 II	20	12.002	107.646	26.458	2.841	12.907	772.976	2.7620
83	11.3	8.6	1900 I	0	64.620	164.860	28.320	5.000	4.728	935.754	2.4317
84	11.3	8.8	1900 I	0	158.176	12.720	328.032	9.362	13.678	977.245	2.3623
A 85	10.9	7.7	1900 I	0	7.070	119.680	204.520	11.900	11.110	820.681	2.6539
86	12.4	8.3	1944 I	31	91.843	305.286	87.307	4.803	12.194	645.221	3.1155
S 87	11.9	7.2	1940 XI	17	74.026	262.105	74.718	10.916	4.754	543.149	3.4946
88	10.8	7.4	1939 IV	13	275.240	33.594	277.207	5.245	9.244	769.947	2.7693
89	10.1	7.1	1911 X	9	0.301	43.904	312.240	16.125	10.533	870.147	2.5524
90	11.6	7.5	1886 I	17	204.801	233.833	72.132	2.277	9.545	635.569	3.1470
A 91	10.8	7.7	1900 I	0	304.530	71.960	10.940	2.120	6.110	851.141	2.5902
92	10.9	6.7	1939 II	15	184.925	224.162	102.554	9.952	4.325	619.647	3.2006
93	10.8	7.4	1875 I	1	278.644	269.755	6.154	8.615	8.082	775.921	2.7551
94	11.3	7.1	1943 III	27	121.642	50.124	3.872	8.038	5.940	634.574	3.1503
S 95	11.3	7.3	1945 IV	6	154.661	152.719	243.694	12.941	8.488	659.098	3.0716
96	11.4	7.4	1940 X	3	209.872	201.159	322.778	16.060	7.866	665.215	3.0528
97	10.6	7.4	1950 I	0	349.300	266.540	160.640	11.760	14.893	813.660	2.6728
98	12.7	9.4	1928 XII	23	305.541	155.794	354.690	15.576	10.796	805.103	2.6881
99	13.7	10.5	1915 I	21	254.415	192.198	42.272	13.932	11.302	815.891	2.6643
100	11.9	7.8	1940 XII	2	102.122	182.394	128.124	6.419	9.492	651.945	3.0941

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$	i	$\phi$	n	a	
	m	m			°	°	°	°	°	"		
						1950.0						
	101	10.7	7.6	1877 XII	11	99.901	343.943	344.648	10.173	7.921	854.438	2.5836
	102	12.6	9.4	1950 I	0	265.680	144.704	211.430	5.114	14.699	817.068	2.6617
	103	10.2	6.9	1895 XI	27	76.269	185.303	136.928	5.405	4.568	798.694	2.7024
S	104	12.2	8.0	1943 II	2	54.864	25.109	42.868	2.851	9.743	636.327	3.1412
	105	11.1	8.5	1895 XI	21	354.140	54.810	188.823	21.494	10.103	970.438	2.3733
	106	11.3	7.2	1936 X	15	347.609	334.176	62.786	4.628	9.503	626.906	3.1759
	107	11.2	6.5	1940 XII	4	315.130	302.288	174.765	9.926	4.203	543.898	3.4914
S	108	11.7	7.4	1945 V	31	116.031	164.846	352.375	4.397	5.382	615.832	3.2139
	109	12.0	8.7	1900 I	0	275.390	52.230	5.260	8.020	17.215	801.147	2.6970
	110	10.5	7.1	1925 I	1	253.991	280.981	57.243	5.997	4.535	785.229	2.7332
	111	11.3	8.2	1900 I	0	228.440	163.540	307.360	4.900	5.900	849.096	2.5944
	112	11.5	8.8	1939 XII	19	107.617	14.508	324.845	2.624	7.353	934.681	2.4335
	113	11.0	8.4	1938 VIII	20	125.158	78.587	123.497	5.035	4.975	968.690	2.3762
A	114	11.1	7.8	1900 I	0	337.040	348.810	164.880	4.910	7.910	810.194	2.6768
	115	10.4	7.8	1890 I	1	299.674	94.238	309.921	11.590	11.116	966.308	2.3801
	116	10.7	7.3	1929 IV	22	29.764	91.551	64.842	3.580	8.072	770.820	2.7672
S	117	11.4	7.5	1941 III	12	113.688	50.107	349.420	14.945	1.399	686.270	2.9900
	118	10.8	8.1	1933 IV	6	94.764	30.752	48.196	7.781	9.433	932.404	2.4375
	119	10.6	7.5	1894 VIII	24	332.857	168.004	204.719	5.725	4.601	855.406	2.5816
	120	11.7	7.6	1936 XII	31	255.816	226.368	343.182	7.013	3.187	644.360	3.1183
S	121	11.2	6.6	1940 I	13	89.802	292.130	75.238	7.586	7.356	553.326	3.4515
	122	11.5	7.2	1945 III	6	354.022	354.914	179.050	1.617	3.484	614.900	3.2171
	123	11.8	8.5	1898 VI	24	211.406	121.708	309.175	6.420	6.962	801.972	2.6950
A	124	10.3	7.1	1900 I	0	227.100	57.620	189.140	2.920	4.430	831.820	2.6302
	125	11.2	7.8	1940 VIII	27	55.646	105.428	169.872	4.642	4.453	781.244	2.7425
	126	11.5	8.8	1929 IX	29	16.542	325.949	23.961	2.945	6.065	931.356	2.4393
	127	10.5	7.1	1933 V	19	3.643	92.188	31.859	8.270	3.690	775.878	2.7551
	128	10.6	7.2	1896 VII	4	101.802	300.002	77.298	6.255	7.281	777.876	2.7504
	129	10.3	6.6	1944 XII	16	197.740	107.115	137.052	12.218	12.222	730.307	2.8686
	130	10.6	6.5	1940 IV	5	179.671	234.433	145.908	22.929	11.842	641.789	3.1266
	131	12.2	9.5	1916 X	30	181.829	157.578	66.124	4.965	3.763	935.350	2.4324
A	132	11.5	8.6	1925 I	1	143.087	253.352	259.662	25.162	22.504	840.372	2.6123
	133	11.3	7.3	1896 XII	11	204.233	285.303	321.903	7.237	7.824	661.661	3.0637
	134	11.1	8.1	1913 VI	6	187.173	82.998	346.753	11.617	6.655	864.286	2.5639
A	135	10.5	7.8	1900 I	0	151.760	336.749	344.807	2.314	11.868	937.441	2.4287
A	136	11.2	8.9	1925 I	1	120.153	131.158	186.652	9.566	4.867	1025.961	2.2869
	137	11.8	7.7	1944 I	15	161.027	104.054	203.846	13.338	12.284	642.237	3.1252
A	138	11.8	9.1	1900 I	0	194.070	258.140	55.380	3.220	9.460	926.278	2.4482
	139	10.9	7.4	1897 I	30	155.614	162.215	3.154	10.926	10.044	764.168	2.7832
	140	11.4	8.0	1900 I	0	272.520	193.500	107.890	3.195	12.437	785.395	2.7328
A	141	11.4	8.2	1900 I	0	13.600	54.880	320.020	11.990	12.360	815.057	2.6660
	142	12.2	9.5	1896 XII	11	211.352	289.860	292.704	2.243	7.736	943.525	2.4182
	143	12.4	9.0	1917 IV	14	0.175	248.991	334.016	11.500	4.104	773.166	2.7616
A	144	10.7	7.5	1900 I	0	162.780	290.480	77.620	4.820	13.530	820.060	2.6553
A	145	11.3	8.1	1900 I	0	351.120	41.780	78.320	12.634	8.354	811.902	2.6730
	146	11.1	7.7	1900 I	0	201.180	142.120	84.870	13.080	3.770	791.366	2.7190
	147	12.5	8.4	1938 XII	18	99.090	102.546	251.147	1.902	1.244	639.043	3.1356
	148	11.0	7.5	1925 I	1	205.789	251.284	145.575	25.329	10.672	769.114	2.7793
	149	12.9	10.0	1925 I	1	81.861	249.870	159.271	0.925	3.741	1106.314	2.1748
	150	11.6	7.7	1940 III	31	203.987	149.124	207.342	2.157	7.138	688.119	2.9847

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
151	11.9	8.8	1921 X	27	245.549	131.509	39.546	6.476	2.012	850.206	2.5921
152	12.2	8.1	1938 I	13	14.825	53.874	41.189	12.203	4.803	638.564	3.1372
S 153	12.6	7.3	1941 VI	19	227.988	49.478	228.432	7.848	8.741	448.926	3.9678
S 154	11.2	7.0	1943 XI	16	192.848	161.093	37.114	21.113	5.768	626.256	3.1781
155	13.5	9.8	1875 XI	9	339.091	39.182	43.884	14.079	14.824	713.787	2.9127
A 156	11.3	7.9	1925 I	1	159.170	334.120	243.430	10.000	12.980	786.078	2.7312
157	13.7	10.6	1900 I	0	265.398	45.362	62.991	12.212	11.458	856.249	2.5799
158	12.3	8.7	1945 IV	13	128.961	144.581	279.869	1.000	3.134	729.715	2.8701
159	12.3	8.2	1944 VI	15	150.909	329.696	135.073	6.080	6.309	649.482	3.1019
160	11.8	8.4	1900 I	0	192.820	48.220	10.080	3.840	3.850	787.472	2.7280
161	11.0	8.4	1896 IV	15	72.965	291.791	19.345	9.063	7.963	966.657	2.3795
162	12.3	8.4	1926 XI	14	273.723	109.096	37.560	6.091	10.210	676.675	3.0182
163	11.5	9.0	1950 I	0	180.350	296.690	160.300	4.775	11.081	974.145	2.3673
164	11.5	8.3	1940 V	25	280.974	282.893	77.526	24.442	20.156	829.991	2.6340
165	11.1	7.0	1886 IV	7	296.999	339.835	304.979	11.190	4.422	640.907	3.1295
166	12.5	9.2	1900 I	0	63.630	261.370	130.170	11.940	12.180	805.950	2.6861
167	13.0	9.4	1950 I	0	111.700	126.670	166.370	2.180	1.965	735.911	2.8540
S 168	11.6	7.1	1941 II	26	100.720	195.541	208.428	4.578	3.218	571.224	3.3791
169	11.3	8.8	1890 VIII	5	328.165	332.181	355.526	5.519	7.526	979.646	2.3584
A 170	11.7	8.7	1900 I	0	248.400	153.880	301.920	14.380	3.640	869.360	2.5539
171	12.1	8.0	1935 VIII	5	169.657	50.171	101.285	2.553	7.689	641.237	3.1284
172	10.4	7.8	1918 VI	3	271.663	357.480	332.763	10.041	6.509	966.330	2.3801
173	11.0	7.6	1941 XI	11	18.907	226.936	148.635	14.218	11.907	780.658	2.7439
174	11.6	8.0	1893 XI	17	201.202	286.047	329.419	12.123	8.303	733.432	2.8604
175	12.3	8.0	1935 X	8	12.466	315.033	24.301	3.208	10.800	609.244	3.2370
176	12.1	7.9	1926 V	8	202.228	181.483	201.366	22.717	10.500	629.690	3.1666
177	12.4	9.0	1939 III	2	118.324	35.688	348.827	1.429	13.565	768.807	2.7720
178	12.0	9.2	1910 III	14	276.891	210.514	51.388	1.914	2.555	919.413	2.4603
179	11.5	7.7	1893 IX	18	89.483	100.816	254.030	7.787	6.437	692.203	2.9729
180	13.3	9.9	1900 I	0	319.900	169.920	315.530	0.898	9.665	790.025	2.7221
181	11.5	7.4	1926 X	15	312.776	315.181	144.358	18.617	11.860	640.903	3.1295
182	11.0	8.3	1900 XII	11	99.621	308.270	107.378	2.005	10.779	944.595	2.4164
183	12.6	9.1	1942 XII	22	17.341	263.202	142.742	26.466	20.285	760.267	2.7927
184	12.4	8.2	1943 X	3	157.745	222.208	333.328	1.160	4.774	626.308	3.1780
185	10.0	6.6	1943 VII	15	286.946	222.145	154.063	23.249	7.333	782.731	2.7390
186	11.4	8.9	1930 X	7	46.320	313.255	15.282	13.191	8.604	977.448	2.3620
187	11.4	8.0	1935 XII	19	269.797	193.401	22.420	10.658	13.697	785.893	2.7317
188	13.0	9.6	1925 I	1	7.029	66.582	242.052	11.754	10.162	772.930	2.7621
A S 189	11.5	8.8	1900 I	0	197.090	166.440	204.130	5.150	2.100	924.921	2.4506
S 190	12.0	6.7	1940 IX	7	264.495	283.505	177.080	6.155	9.664	453.044	3.9439
191	12.0	8.3	1938 XII	8	55.631	223.909	160.538	11.487	4.974	720.054	2.8957
192	9.3	6.7	1933 X	20	15.267	28.348	343.649	6.857	14.342	952.916	2.4023
193	12.9	9.8	1950 I	0	20.470	79.510	350.890	12.073	17.294	845.592	2.6026
A 194	10.5	7.4	1900 I	0	208.790	160.550	160.040	18.420	13.880	838.265	2.6167
195	12.6	8.9	1941 VI	19	340.013	114.017	7.689	6.976	2.305	726.476	2.8787
196	10.3	6.3	1940 V	2	323.632	193.693	73.256	7.279	1.014	645.474	3.1147
197	12.7	9.3	1925 I	0	313.790	243.640	82.340	8.824	9.268	782.198	2.7403
A 198	11.1	8.3	1900 I	0	47.970	86.550	269.390	9.290	13.240	920.104	2.4591
199	12.4	8.2	1936 VIII	14	55.500	168.294	90.061	15.429	10.609	631.462	3.1606
200	11.3	7.9	1900 I	0	106.340	82.780	326.120	6.920	7.680	783.247	2.7378



No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
201	11.9	8.6	1900 I	0	227.310	177.920	157.780	5.730	10.380	809.400	2.6786
202	10.7	6.7	1941 I	9	5.960	355.891	137.762	8.812	5.457	658.566	3.0733
A 203	11.7	8.3	1900 I	0	141.060	55.230	349.730	3.210	3.450	783.382	2.7375
A 204	12.0	8.7	1900 I	0	340.720	51.780	206.320	8.280	9.960	812.586	2.6715
205	12.7	9.2	1900 I	0	136.540	171.460	213.150	10.660	2.062	766.453	2.7776
A 206	12.0	8.6	1900 I	0	100.470	298.400	146.440	3.780	2.310	781.877	2.7411
A 207	11.8	9.5	1925 I	1	206.103	190.693	29.611	3.822	1.651	1027.841	2.2839
S 208	12.1	8.4	1945 I	16	354.480	129.188	5.268	1.772	0.802	721.185	2.8927
209	11.5	7.4	1934 VIII	18	69.516	246.012	2.248	7.261	2.779	634.893	3.1492
210	12.5	9.1	1900 I	0	172.240	11.540	33.460	5.290	7.040	789.919	2.7224
211	11.5	7.5	1937 I	28	269.913	172.363	265.122	3.871	9.013	667.887	3.0446
S 212	12.2	8.1	1944 XI	22	11.443	97.973	314.937	4.279	5.992	644.854	3.1167
213	11.7	8.3	1945 VII	29	4.250	161.212	122.402	6.773	8.245	776.653	2.7533
214	12.1	9.0	1920 X	10	277.208	128.079	343.267	3.466	1.793	840.802	2.6114
215	12.7	9.3	1925 I	1	124.055	318.499	25.938	1.728	1.951	771.061	2.7666
A 216	10.1	6.6	1925 I	1	4.215	177.347	216.119	13.082	14.545	759.529	2.7945
217	13.1	9.5	1937 III	5	233.972	152.597	163.545	10.378	18.209	731.250	2.8661
218	11.4	8.2	1900 I	0	259.170	59.200	171.800	15.210	6.620	814.336	2.6676
219	11.2	8.8	1900 I	0	140.870	140.170	201.450	10.820	12.960	982.279	2.3542
220	13.6	11.0	1932 XI	15	38.634	76.536	258.626	7.598	14.969	986.238	2.3479
S 221	11.3	7.4	1943 XII	31	114.206	188.546	142.474	10.864	5.615	678.506	3.0128
222	12.9	8.8	1945 IX	17	65.854	183.171	80.412	2.168	7.574	636.419	3.1442
223	13.3	9.2	1943 VI	6	149.672	55.074	48.850	1.974	6.949	651.747	3.0947
A 224	11.7	8.5	1900 I	0	332.470	277.800	354.400	5.870	2.530	824.609	2.6455
S 225	12.7	8.2	1943 I	10	197.486	96.902	200.360	20.660	16.579	576.005	3.3604
226	13.0	9.7	1900 I	0	345.119	149.946	136.084	15.806	11.854	794.092	2.7127
227	12.9	8.7	1939 X	23	149.790	264.193	328.197	9.122	11.720	634.451	3.1507
228	14.5	12.4	1925 I	1	348.135	15.955	314.383	2.560	13.917	1086.223	2.2015
229	13.5	8.9	1943 III	10	211.947	297.212	30.803	2.141	8.023	562.138	3.4154
230	10.3	7.7	1897 X	27	11.516	137.184	240.475	9.418	3.548	964.909	2.3824
231	12.4	8.6	1940 I	24	257.888	263.479	352.188	5.132	9.042	711.640	2.9185
232	13.4	10.4	1918 XI	23	235.419	47.343	153.278	6.057	9.737	868.520	2.5555
A 233	11.3	8.1	1900 I	0	187.650	122.460	223.440	7.650	5.770	817.747	2.6602
234	11.7	9.1	1923 VII	3	287.075	189.962	144.680	15.349	14.129	962.791	2.3859
235	12.2	8.5	1926 VIII	4	37.411	208.100	67.228	9.069	3.463	725.118	2.8823
236	11.4	7.9	1914 V	3	0.629	171.513	186.915	7.637	10.875	757.413	2.7998
237	12.8	9.4	1939 V	22	323.404	196.874	84.933	9.755	4.034	772.923	2.7622
A 238	11.7	8.0	1929 X	5	347.800	206.572	185.151	12.382	5.185	716.040	2.9065
239	14.0	10.2	1936 XII	20	41.279	204.283	181.663	6.152	13.758	693.630	2.9688
A 240	12.5	9.3	1900 I	0	134.697	297.820	115.716	2.095	11.949	815.609	2.6648
241	11.2	7.2	1938 XII	8	79.967	71.144	271.977	5.510	5.781	666.782	3.0480
A 242	12.6	9.0	1940 V	12	89.908	276.338	207.946	11.323	6.964	732.507	2.8628
A 243	13.3	9.7	1945 V	4	142.470	107.340	326.185	1.152	2.655	733.168	2.8611
244	13.7	11.7	1935 VIII	22	320.471	164.131	209.425	2.823	7.919	1106.455	2.1746
245	12.5	8.5	1940 III	3	110.878	324.391	62.181	5.174	11.397	650.929	3.0973
A 246	11.7	8.4	1900 I	0	47.480	93.500	163.300	15.620	6.140	802.058	2.6949
247	11.0	7.6	1938 XII	8	37.208	54.174	0.420	25.052	13.931	781.511	2.7419
248	13.0	10.2	1900 I	0	266.700	4.710	247.750	3.983	3.697	913.453	2.4710
249	13.6	11.1	1916 I	2	69.918	39.772	335.393	9.674	12.468	967.740	2.3778
S 250	11.5	7.3	1942 XII	16	355.352	70.116	25.305	12.886	8.118	637.412	3.1409



No.	m	g	Epoch	$0^hUT$	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
251	13.6	9.6	1940 XI	30	339.840	283.261	157.057	10.482	6.082	650.840	3.0976
252	13.0	8.8	1945 V	15	225.283	167.890	202.736	10.058	4.212	632.420	3.1574
253	13.4	10.2	1900 I	0	150.360	154.000	180.700	6.620	15.400	823.557	2.6478
254	13.4	11.3	1925 I	1	283.612	231.482	28.700	4.524	6.967	1091.117	2.1949
A 255	13.3	9.9	1950 I	0	37.440	152.090	13.900	9.530	4.580	779.663	2.7462
256	13.2	9.3	1939 VII	21	58.095	43.766	183.786	13.314	3.652	683.229	2.9989
257	12.8	8.7	1943 XI	4	298.881	25.511	35.360	3.677	6.422	643.715	3.1204
258	11.1	8.0	1900 I	0	318.530	152.290	208.420	14.200	11.860	838.757	2.6156
259	12.1	8.0	1944 XII	12	195.613	159.682	87.941	10.773	7.471	640.242	3.1317
S 260	13.9	9.2	1943 VII	8	323.348	174.415	167.200	6.329	6.101	552.967	3.4531
261	11.5	9.0	1920 III	9	10.062	64.509	96.947	3.640	5.202	996.557	2.3317
262	14.1	11.1	1900 I	0	66.531	21.927	39.122	7.757	12.233	869.372	2.5539
263	13.3	9.6	1900 I	0	266.260	156.790	218.150	1.281	4.441	723.311	2.8870
A 264	12.1	8.6	1923 IX	12	313.981	337.810	50.436	10.454	7.815	758.372	2.7974
265	13.8	11.1	1932 II	5	291.374	250.715	335.894	25.700	15.435	942.309	2.4204
A 266	11.7	8.2	1925 I	1	234.157	148.825	236.670	13.372	9.063	755.392	2.8047
267	14.0	10.5	1939 X	25	109.111	193.699	74.384	6.015	5.787	767.197	2.7759
268	12.5	8.2	1943 VII	24	167.671	65.937	121.421	2.430	7.753	652.024	3.0938
A 269	12.7	9.6	1900 I	0	20.320	115.920	158.280	5.450	12.340	838.749	2.6157
270	11.0	8.9	1925 I	1	186.433	77.872	255.408	2.359	8.669	1088.505	2.1985
271	12.8	8.9	1941 I	12	72.927	51.191	336.958	3.562	5.899	681.469	3.0041
272	13.6	10.1	1932 X	1	267.915	65.405	38.366	4.479	1.636	766.147	2.7784
273	11.6	9.0	1932 I	9	197.040	119.594	159.256	20.395	9.323	957.251	2.3951
274	13.6	9.6	1944 XI	15	221.988	119.179	93.332	3.679	7.212	669.449	3.0399
275	12.0	8.5	1929 II	1	317.694	36.457	135.303	4.736	9.336	769.244	2.7710
276	11.8	7.7	1942 I	29	10.531	263.436	211.716	21.604	3.737	644.571	3.1176
277	13.1	9.4	1929 XI	8	19.979	133.497	233.350	1.138	5.125	723.841	2.8856
278	12.7	9.3	1945 XII	11	244.180	138.973	62.335	7.824	7.619	775.742	2.7554
S 279	13.8	8.0	1938 II	1	294.407	213.957	75.399	2.346	3.494	404.906	4.2504
280	14.4	10.6	1930 I	7	8.657	82.492	11.298	7.463	6.360	702.560	2.9436
281	13.1	11.0	1925 I	1	55.665	15.116	31.534	5.322	7.604	1096.400	2.1879
282	13.3	10.8	1925 I	1	63.894	294.738	145.330	9.018	4.678	991.514	2.3396
283	11.8	7.8	1943 III	26	197.855	54.243	305.188	8.021	8.805	669.162	3.0408
284	12.9	10.4	1936 IV	13	300.176	56.124	234.409	8.054	12.785	979.456	2.3588
285	14.9	10.9	1939 XII	17	89.869	17.253	311.964	17.541	12.251	656.338	3.0802
286	13.2	9.0	1939 V	12	162.233	269.793	149.827	17.856	1.622	621.163	3.1955
287	10.7	8.2	1943 VII	15	40.552	120.749	142.323	10.026	1.350	982.885	2.3533
288	12.5	9.1	1939 XII	28	282.092	80.767	121.162	4.333	12.028	775.328	2.7564
289	13.0	9.3	1950 I	0	225.600	187.500	182.450	6.662	11.807	728.114	2.8743
290	13.9	11.5	1941 VI	19	164.481	104.362	10.676	22.297	14.990	992.559	2.3380
291	13.6	11.4	1925 I	1	243.903	330.014	161.701	1.844	5.345	1071.145	2.2221
A 292	12.5	9.5	1900 I	0	35.621	287.388	43.761	14.874	1.799	881.623	2.5302
293	12.9	9.2	1950 I	0	198.080	85.000	61.860	15.630	6.070	732.726	2.8623
294	13.4	9.3	1940 VIII	1	340.698	183.493	136.834	6.207	13.154	631.834	3.1594
A 295	13.5	10.0	1950 I	0	182.990	145.340	277.240	2.680	9.790	758.490	2.7971
296	13.3	11.1	1917 XII	11	42.507	251.467	121.452	1.743	9.213	1066.369	2.2288
297	13.3	9.1	1939 III	12	221.941	350.867	333.630	7.514	6.977	625.622	3.1802
298	13.5	11.3	1925 I	1	253.116	133.031	8.452	6.301	5.508	1041.584	2.2640
299	14.5	11.7	1900 I	0	152.078	148.337	242.767	1.588	3.590	934.178	2.4343
300	12.5	8.2	1935 VII	17	294.035	309.614	42.778	0.763	2.139	617.301	3.2074

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
S 301	12.7	9.3	1900 I	0	153.130	120.650	143.160	4.840	3.690	788.543	2.7255
302	13.9	11.2	1901 IX	17	292.099	53.051	8.433	3.440	6.348	951.035	2.4055
303	12.0	7.9	1944 XI	15	358.296	62.862	344.981	6.913	3.316	642.667	3.1238
304	12.4	9.7	1933 VI	18	316.214	170.431	159.346	15.773	12.794	951.612	2.4045
305	12.5	8.4	1940 III	7	32.102	255.909	209.629	4.421	10.891	651.092	3.0968
A 306	10.7	8.2	1925 I	1	346.321	166.105	142.263	7.249	8.677	979.892	2.3581
307	13.1	9.4	1941 III	28	107.557	320.540	101.597	6.110	7.995	714.693	2.9102
A 308	11.0	7.6	1925 I	1	41.443	113.810	182.262	4.340	2.145	778.018	2.7501
309	12.7	9.5	1927 IX	2	32.894	309.080	357.242	3.779	6.593	815.525	2.6651
310	13.5	10.1	1900 I	0	359.230	319.100	231.050	3.126	6.668	772.783	2.7625
A 311	13.0	9.3	1931 VIII	9	148.874	80.463	81.752	3.262	0.436	719.115	2.8983
312	12.5	9.0	1936 IV	10	293.841	260.111	7.201	9.062	9.222	764.900	2.7814
313	10.3	7.7	1900 I	0	324.280	313.300	177.310	11.590	10.430	968.809	2.3760
314	14.0	9.9	1945 III	29	194.954	192.909	170.814	12.517	9.890	630.879	3.1626
315	14.0	11.8	1930 II	23	175.640	171.241	161.901	2.404	9.684	1057.209	2.2416
A 316	13.3	9.1	1943 XII	2	347.310	322.477	123.868	2.344	8.101	628.190	3.1716
317	12.2	9.8	1925 I	1	226.586	185.156	151.385	1.747	4.910	1026.093	2.2867
318	13.2	9.0	1946 II	21	43.813	301.504	162.084	10.645	3.059	618.197	3.2057
S 319	14.2	9.7	1944 III	9	102.388	213.593	189.089	10.763	12.656	565.429	3.4021
320	13.7	9.8	1946 III	1	154.983	145.107	220.779	9.335	6.426	678.005	3.0143
A 321	13.2	9.5	1903 II	19	73.020	34.094	41.260	2.619	2.651	723.655	2.8861
322	12.3	8.8	1941 VI	3	275.656	112.148	253.599	7.990	14.150	763.632	2.7845
323	12.1	10.1	1930 III	8	179.499	290.527	97.682	24.207	17.527	965.135	2.3820
A 324	9.9	6.6	1900 I	0	42.070	40.980	329.450	11.264	19.805	806.978	2.6839
325	12.4	8.1	1939 IV	27	167.909	74.390	345.473	8.564	10.234	621.923	3.1929
A 326	11.1	8.7	1925 I	1	43.152	237.150	32.563	23.759	10.891	1005.578	2.3177
327	13.0	9.5	1934 IV	9	288.323	304.445	355.657	7.160	3.558	767.052	2.7762
328	12.3	8.2	1941 I	9	41.301	100.886	353.170	16.130	6.199	647.122	3.1094
A 329	12.1	9.3	1900 I	0	317.330	46.560	179.090	15.930	1.480	910.798	2.4758
330	13.5	11.7	1892 III	21	181.070	0.000	359.580	19.980	0.000	1174.900	2.0893
A 331	12.5	8.5	1938 I	16	113.540	333.471	23.002	6.069	5.434	673.389	3.0280
332	12.6	9.1	1950 I	0	36.540	295.760	31.800	2.872	5.189	768.264	2.7733
333	12.7	8.6	1939 II	23	127.272	17.357	354.837	3.799	9.158	639.887	3.1328
S 334	12.0	6.8	1943 III	23	239.682	163.324	131.537	4.608	3.169	463.807	3.8825
335	11.6	8.8	1950 I	0	313.000	139.970	148.200	5.095	10.040	911.105	2.4753
A 336	11.8	9.6	1925 I	1	289.263	29.354	235.371	5.639	5.450	1049.973	2.2519
337	11.4	8.8	1935 IV	11	134.035	97.255	356.139	7.867	7.944	964.213	2.3835
338	12.1	8.4	1950 I	0	155.730	115.040	288.130	6.040	1.158	713.646	2.9131
339	12.8	8.8	1939 X	6	24.425	160.827	174.329	9.914	5.871	678.025	3.0143
A 340	12.9	9.5	1900 I	0	165.410	38.640	28.480	4.700	6.750	779.421	2.7468
A 341	13.1	11.0	1925 I	1	350.152	292.054	29.313	5.666	11.193	1087.737	2.1995
342	12.8	9.8	1900 I	0	219.830	222.120	233.600	7.350	7.520	862.173	2.5681
343	13.5	10.9	1900 I	0	333.098	6.881	39.443	3.308	13.287	947.338	2.4117
344	11.7	8.5	1941 IV	8	294.361	235.575	48.805	18.491	18.249	848.413	2.5958
A 345	11.2	8.8	1925 I	1	352.891	228.308	213.246	9.728	3.514	1000.550	2.3253
A 346	11.5	8.0	1941 III	27	151.941	287.663	92.961	8.746	5.807	758.852	2.7962
A 347	12.0	8.8	1900 I	0	154.970	83.240	86.560	11.700	9.450	839.909	2.6133
348	12.9	9.1	1928 XII	23	346.441	6.347	90.695	9.754	3.894	692.854	2.9711
A 349	9.8	6.0	1945 V	9	220.957	345.746	32.830	8.268	5.128	709.808	2.9235
350	12.7	8.6	1939 V	24	162.295	335.808	90.581	24.866	9.209	646.677	3.1109

## ELEMENTS

No.	m	g	Epoch	$0^hUT$	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	"		
A 351	12.2	8.8	1940 V	13	77.940	28.731	100.090	9.250	9.057	771.698	2.7649
A 352	12.1	10.0	1900 I	0	123.170	142.260	247.770	3.420	8.610	1091.681	2.1942
353	14.2	10.9	1940 VI	1	203.931	319.504	102.928	5.673	19.340	785.580	2.7324
S 354	10.0	6.5	1943 XII	11	293.918	5.795	140.765	18.438	6.756	759.520	2.7945
A 355	13.1	10.1	1942 IV	18	81.891	103.657	353.374	4.280	5.656	876.869	2.5393
356	11.0	7.6	1950 I	0	194.620	76.100	355.920	8.280	13.910	775.043	2.7571
S 357	12.2	8.0	1943 I	15	83.877	253.958	138.554	15.063	4.987	634.751	3.1497
358	12.5	8.8	1925 I	1	270.149	249.854	173.340	3.527	8.658	726.551	2.8785
359	12.3	8.9	1900 I	0	18.762	334.971	7.268	6.813	8.952	786.858	2.7294
S 360	11.9	8.0	1943 XII	3	358.914	287.683	133.227	11.694	10.098	681.794	3.0031
S 361	13.3	8.0	1943 VIII	4	208.762	73.070	19.413	12.673	12.342	453.558	3.9408
A 362	11.1	8.0	1900 I	0	349.900	27.850	28.240	8.080	2.540	856.681	2.5790
363	11.6	8.2	1932 XII	1	63.306	292.278	65.603	5.968	4.028	778.872	2.7481
A 364	11.7	9.5	1925 I	1	321.939	311.227	105.723	5.995	8.602	1072.152	2.2208
365	12.2	8.7	1900 I	0	292.970	212.700	186.320	12.763	8.854	755.944	2.8034
366	12.3	8.2	1945 IX	27	24.327	332.450	347.344	10.598	3.790	637.194	3.1416
367	12.5	10.3	1925 I	1	294.998	53.658	83.581	2.950	5.505	1073.029	2.2196
368	13.5	9.5	1925 I	1	260.993	88.338	229.304	7.715	11.869	660.096	3.0686
369	12.7	9.5	1900 I	0	101.820	266.420	95.160	12.720	5.600	822.859	2.6492
370	12.8	10.4	1925 I	1	268.228	66.807	291.345	7.866	5.217	1001.127	2.3246
A 371	11.8	8.4	1944 XII	3	178.706	338.906	284.151	7.380	3.654	788.446	2.7258
372	10.5	6.4	1938 IX	16	303.318	115.204	327.992	23.770	14.452	629.851	3.1660
373	12.8	8.7	1939 I	6	95.680	344.561	4.443	15.406	8.217	644.625	3.1174
374	11.7	8.2	1930 I	1	51.102	23.109	220.093	8.960	4.561	765.534	2.7799
375	11.0	6.9	1940 II	13	187.231	333.904	337.663	15.968	5.970	641.922	3.1262
A 376	11.8	9.4	1925 I	1	103.296	314.401	302.609	5.420	9.876	1024.719	2.2888
377	11.5	8.2	1915 IX	30	330.645	192.632	211.334	6.656	4.437	804.000	2.6905
378	11.6	9.1	1929 VII	11	281.405	154.815	233.438	6.977	7.361	766.778	2.7769
379	12.6	8.5	1939 II	16	146.445	177.298	172.834	1.607	10.174	636.239	3.1446
380	12.6	9.3	1950 I	0	44.630	238.800	95.140	6.170	6.510	809.319	2.6787
381	12.4	8.1	1931 IX	24	78.254	138.904	125.846	12.586	7.402	620.773	3.1968
382	12.1	8.1	1942 XII	14	246.043	264.474	315.920	7.421	9.698	641.446	3.1277
383	13.3	9.2	1939 III	1	93.861	320.842	93.236	2.660	9.803	637.827	3.1396
A 384	11.7	8.5	1900 I	0	179.490	31.650	48.740	5.640	8.500	821.455	2.6523
385	10.3	6.7	1943 VII	27	97.805	188.285	345.691	13.598	7.201	738.257	2.8480
386	10.5	6.8	1939 IV	26	183.146	219.014	167.249	20.254	9.751	719.584	2.8970
387	10.9	7.5	1900 I	0	349.400	154.420	128.780	17.970	13.810	782.641	2.7392
388	11.7	7.8	1943 X	3	28.081	324.603	355.301	6.477	3.620	681.103	3.0051
389	11.1	8.0	1950 I	0	60.870	263.440	282.790	8.135	3.770	842.106	2.6086
390	13.2	10.0	1900 I	0	141.560	187.190	306.200	12.174	7.626	821.427	2.6523
A 391	13.2	10.8	1925 I	1	214.501	145.468	213.060	23.097	17.948	1003.862	2.3204
392	12.2	8.3	1925 I	1	74.986	171.714	210.613	14.296	8.114	724.427	2.8841
393	11.0	7.6	1941 XII	16	127.133	88.330	213.977	14.818	19.373	765.065	2.7810
394	12.8	9.4	1944 VIII	24	354.275	267.726	67.977	6.238	13.161	773.017	2.7619
395	13.0	9.5	1925 I	1	321.555	9.324	260.759	3.351	4.832	763.256	2.7854
396	13.2	9.7	1944 XII	19	167.981	17.385	250.834	2.537	9.139	782.522	2.7395
397	12.2	9.0	1931 III	23	222.663	137.863	228.708	12.797	14.366	829.980	2.6341
398	13.7	10.4	1900 I	0	55.110	156.040	281.340	9.490	13.060	782.827	2.7389
399	13.0	9.0	1928 VI	6	76.429	183.524	347.344	13.165	4.403	665.964	3.0505
400	15.2	11.1	1939 III	15	314.445	232.348	328.600	10.589	6.640	640.817	3.1298

No.	m	g	Epoch	$0^h$ UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
S 401	12.6	8.2	1945 VII	4	353.179	242.728	37.996	5.973	3.244	582.671	3.3347
402	10.7	7.7	1900 I	0	86.220	13.620	130.280	11.860	6.620	867.324	2.5578
S 403	12.0	8.5	1943 VII	31	177.204	249.955	246.052	9.163	5.565	752.693	2.8114
404	13.0	10.0	1900 I	0	68.500	117.950	93.260	14.080	11.650	850.008	2.5926
405	11.0	8.0	1900 I	0	98.070	305.410	256.580	11.843	14.367	854.643	2.5831
406	13.5	9.8	1925 I	0	310.540	34.230	317.320	4.259	10.345	712.405	2.9164
407	11.9	8.7	1900 I	0	8.280	79.360	295.540	7.500	4.050	834.258	2.6251
408	13.4	9.2	1943 IV	16	156.862	99.158	299.227	9.092	9.073	633.446	3.1540
409	10.7	7.6	1943 VI	5	11.474	353.985	242.497	11.272	4.175	858.474	2.5754
410	11.9	8.5	1950 I	0	204.880	170.580	97.280	10.900	13.820	788.148	2.7264
411	12.5	8.7	1943 V	27	332.774	180.006	107.849	15.315	6.683	706.032	2.9339
412	11.9	8.5	1931 XII	1	203.500	92.267	107.229	13.758	2.471	772.392	2.7634
413	12.2	9.2	1944 VI	24	312.012	250.604	104.752	18.743	19.946	854.488	2.5835
S 414	13.4	8.6	1942 II	10	50.508	322.131	111.984	5.533	4.101	540.395	3.5064
415	11.6	8.1	1944 V	28	181.400	295.374	127.717	8.121	17.964	763.671	2.7844
416	11.5	8.0	1943 VII	15	18.923	196.719	58.690	12.985	12.943	763.425	2.7850
417	12.7	9.2	1926 X	15	212.165	343.392	200.148	6.582	7.967	758.779	2.7964
418	12.6	9.5	1900 I	0	263.770	123.940	249.860	6.820	6.860	849.695	2.5932
A 419	11.1	8.0	1900 I	0	336.200	40.620	230.780	3.970	14.640	848.970	2.5948
S 420	12.3	7.7	1945 VI	1	169.712	189.290	245.199	6.631	1.326	560.169	3.4234
421	14.2	11.2	1939 IV	21	167.701	208.089	188.077	7.803	16.825	877.798	2.5375
422	13.4	11.2	1925 I	1	200.347	333.601	9.346	5.015	12.364	1066.582	2.2285
S 423	11.2	7.2	1943 VII	18	18.198	206.847	69.993	11.254	2.256	660.291	3.0679
424	12.8	9.3	1931 VI	17	199.674	329.458	100.085	8.204	6.373	767.988	2.7739
425	13.1	9.4	1946 I	2	282.250	123.852	61.656	4.104	3.393	723.834	2.8857
426	11.5	7.8	1929 I	31	313.428	219.467	312.094	19.539	5.912	723.125	2.8876
A 427	12.8	9.0	1941 II	14	195.186	8.202	298.657	5.135	6.863	693.308	2.9698
428	13.5	11.1	1938 V	21	222.061	12.444	17.787	6.217	10.363	1012.900	2.2541
429	12.6	9.4	1900 I	0	203.180	165.490	220.900	9.487	7.142	842.652	2.6076
430	13.2	9.6	1938 V	11	161.984	176.612	249.995	14.689	15.195	742.062	2.8382
431	12.6	8.5	1940 I	1	293.512	214.186	117.145	1.820	9.746	638.079	3.1387
432	11.3	8.5	1932 V	9	332.033	172.247	88.977	12.126	8.362	972.832	2.3694
433	10.7	11.6	1941 VII	25	350.885	178.065	304.004	10.829	12.872	2015.135	1.4581
A 434	11.8	10.4	1925 I	1	301.065	123.100	175.196	22.504	4.235	1308.763	1.9443
435	12.1	9.3	1906 XI	10	44.443	331.200	23.640	1.843	8.899	925.278	2.4499
436	12.9	8.7	1946 I	25	100.219	13.810	352.149	18.633	4.126	621.018	3.1960
437	12.7	10.1	1922 I	29	123.921	59.386	264.162	7.375	14.473	963.602	2.3846
438	11.8	8.8	1900 I	0	246.760	205.440	49.780	7.390	3.825	869.171	2.5544
439	12.7	8.6	1945 II	28	70.192	244.173	202.167	19.112	3.791	639.196	3.1350
440	13.1	10.9	1925 I	1	274.173	176.816	292.819	1.600	6.191	1079.628	2.2105
441	12.5	9.0	1941 VI	19	359.409	198.324	254.318	8.133	4.606	754.334	2.8074
442	12.1	9.6	1900 I	0	23.960	82.360	135.400	6.070	4.060	987.787	2.3455
A 443	12.5	10.2	1925 I	1	293.611	347.542	175.525	4.222	2.315	1075.889	2.2156
444	11.2	7.7	1940 III	1	170.061	152.119	196.275	10.226	10.031	769.091	2.7713
445	12.6	8.4	1937 IV	25	233.969	74.937	293.822	21.451	12.280	627.264	3.1747
446	11.4	7.9	1925 IV	3	220.846	278.334	42.877	10.640	7.193	762.548	2.7872
447	12.1	8.2	1899 XI	6	359.061	319.305	73.024	4.819	2.576	687.394	2.9868
448	13.4	9.3	1931 VI	1	289.842	289.206	38.970	12.697	10.840	639.465	3.1341
449	12.0	9.0	1925 I	0	335.630	45.010	86.500	3.100	9.800	869.480	2.5536
450	13.2	9.3	1945 VI	26	276.308	357.353	15.102	10.204	5.976	678.274	3.0135

No.	m g		Epoch 0 <sup>h</sup> UT		M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
451	10.6	6.6	1944 III	6	90.724	340.674	89.759	15.225	4.404	662.215	3.062
452	16.7	13.1	1900 I	1	296.812	46.773	93.328	3.220	1.223	736.622	2.852
453	12.3	10.2	1925 I	1	180.895	218.569	11.902	5.570	6.230	1099.800	2.183
A 454	11.6	8.5	1900 I	0	326.530	173.440	33.060	6.320	6.340	833.109	2.627
455	11.6	8.3	1900 I	0	251.898	269.440	77.874	11.999	17.007	819.323	2.656
456	12.9	9.4	1900 I	0	345.916	3.386	229.967	14.465	10.384	762.268	2.787
457	15.1	11.0	1938 X	9	352.050	125.548	250.654	12.881	10.461	652.780	3.091
458	13.1	9.1	1938 I	28	46.398	274.007	135.653	12.611	14.000	684.620	2.994
459	13.7	10.5	1900 X	23	348.242	17.938	30.378	10.311	12.311	836.312	2.620
460	13.9	10.5	1900 I	0	313.280	159.060	206.540	4.590	5.980	791.788	2.718
461	14.3	10.4	1943 VIII	19	228.759	302.261	157.539	1.431	8.165	643.370	3.121
462	13.5	9.7	1944 X	30	43.677	247.133	105.511	3.191	4.996	728.810	2.872
463	14.0	11.4	1926 X	5	10.818	327.849	36.790	13.550	12.594	955.158	2.398
464	12.2	8.6	1950 I	0	252.390	256.620	102.830	10.157	11.743	755.954	2.803
465	13.5	9.3	1932 XII	13	234.732	278.893	303.815	4.634	12.296	654.968	3.084
S 466	11.8	7.3	1945 III	22	353.155	258.203	291.471	19.056	3.568	572.069	3.375
467	14.3	10.5	1925 I	1	321.710	87.966	323.575	6.410	6.254	702.170	2.944
468	13.1	9.0	1944 XII	16	86.578	328.834	20.887	0.492	10.968	638.087	3.138
469	12.7	8.5	1942 VII	20	83.986	209.768	334.698	11.725	10.207	632.204	3.158
470	12.9	10.3	1900 I	0	228.415	43.501	174.109	7.222	5.383	951.397	2.404
471	10.1	6.2	1901 V	19	240.319	311.400	85.240	14.906	13.512	722.892	2.888
472	11.5	8.5	1900 I	0	107.090	294.430	127.580	15.860	5.473	874.747	2.543
473	13.3	9.5	1901 II	14	95.235	57.108	334.148	27.780	14.811	690.051	2.979
474	13.0	10.2	1900 I	0	99.425	153.780	162.518	8.715	12.055	922.899	2.454
475	13.5	10.2	1941 II	8	150.093	303.765	35.339	18.791	22.577	850.594	2.591
476	11.3	8.1	1919 XI	30	132.173	356.841	287.280	10.946	4.256	822.591	2.649
477	12.1	9.5	1916 VIII	30	3.442	320.653	11.289	5.316	10.955	945.322	2.415
478	10.9	7.0	1941 V	6	102.750	242.216	234.544	13.153	4.766	676.713	3.018
479	13.0	9.6	1900 I	0	213.680	266.360	137.390	8.660	12.660	790.485	2.721
A 480	11.5	8.3	1900 I	0	46.710	211.380	237.910	21.290	2.640	825.210	2.644
481	11.6	8.2	1907 III	10	104.786	346.121	67.624	9.878	9.086	781.935	2.740
482	12.0	8.1	1938 I	26	245.704	84.854	180.304	14.441	5.502	682.822	3.000
S 483	12.5	7.9	1944 XII	22	105.365	161.810	175.289	18.684	2.472	559.435	3.426
484	12.9	9.7	1900 I	0	77.100	187.220	128.280	12.460	3.180	814.270	2.667
485	11.4	8.0	1925 I	1	91.150	269.340	194.710	13.780	11.000	777.872	2.750
486	13.5	11.0	1927 IV	3	339.547	120.966	94.902	11.026	9.264	983.727	2.351
A 487	11.8	8.6	1900 I	0	66.100	278.340	115.760	10.260	5.020	813.071	2.670
488	11.5	7.3	1941 III	27	24.955	73.458	85.039	11.497	9.824	633.291	3.154
489	12.5	8.3	1935 VII	11	128.769	356.003	167.886	12.930	2.996	634.701	3.149
S 490	12.3	8.1	1945 III	5	152.202	203.210	178.948	9.215	4.422	624.240	3.185
491	12.5	8.3	1939 II	18	77.754	241.691	175.815	18.849	3.728	619.579	3.200
492	13.1	9.0	1945 IV	15	275.718	293.449	46.776	1.642	10.290	646.333	3.112
493	14.5	10.4	1943 II	5	79.087	43.865	358.337	15.363	9.945	644.677	3.117
494	12.3	8.4	1944 XII	16	195.017	211.406	38.934	7.136	3.667	688.313	2.984
495	12.5	9.7	1900 I	0	108.750	205.590	187.420	2.270	7.610	904.749	2.486
496	13.0	11.0	1936 III	16	35.428	256.475	207.774	3.781	4.570	1087.535	2.199
497	13.5	9.9	1935 IX	3	314.548	1.000	7.214	4.900	17.648	737.818	2.849
A 498	11.2	8.1	1950 I	0	25.950	239.300	97.750	9.560	12.890	821.995	2.651
S 499	13.0	7.7	1943 II	21	66.322	182.849	256.437	2.058	12.852	450.282	3.959
A 500	12.0	8.9	1900 I	0	188.910	71.960	291.090	9.790	8.340	839.930	2.613



No.	m	g	Epoch	UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
						1950.0					
501	13.0	8.8	1923 VIII	12	348.054	353.171	358.211	20.886	8.232	632.058	3.1586
502	13.8	11.2	1941 VII	25	130.545	18.372	132.919	25.013	10.247	964.206	2.3836
503	12.3	9.0	1937 VIII	6	257.104	39.096	69.526	5.042	10.173	789.702	2.7229
504	12.7	9.3	1940 I	3	84.845	245.691	105.234	12.924	12.595	791.096	2.7197
A 505	12.0	8.7	1904 II	14	22.404	333.724	91.699	9.802	14.241	806.149	2.6857
506	12.5	8.5	1938 X	16	302.982	144.871	313.671	16.973	8.166	668.158	3.0438
507	12.5	8.3	1940 XI	11	12.719	92.436	295.085	9.549	6.362	633.825	3.1528
S 508	12.3	8.1	1943 VI	21	340.039	235.515	44.965	13.376	1.375	630.739	3.1630
S 509	11.5	7.5	1945 II	19	144.021	150.123	218.349	15.340	5.061	659.684	3.0698
510	13.0	9.8	1900 I	0	35.880	87.290	204.220	9.520	11.070	841.632	2.6097
511	9.6	5.4	1945 XII	11	3.054	327.603	108.795	15.742	10.101	624.346	3.1846
512	12.5	10.5	1944 II	20	140.841	247.721	107.389	8.781	14.682	1094.467	2.1905
513	12.3	8.4	1938 IV	15	166.385	221.276	185.623	9.723	4.916	678.639	3.0124
514	12.4	8.4	1935 VII	17	313.298	119.290	270.046	3.871	2.316	667.428	3.0460
515	14.0	9.9	1903 IX	21	317.149	288.854	122.555	2.011	10.060	645.556	3.1144
A 516	11.0	7.7	1950 I	0	322.690	255.570	330.300	13.010	15.850	808.893	2.6797
517	13.1	9.0	1939 III	1	80.972	140.272	275.652	3.202	10.738	634.248	3.1513
518	13.4	10.5	1900 I	0	66.830	114.970	204.810	6.770	12.920	879.092	2.5350
519	12.0	8.5	1938 III	6	169.066	300.654	45.437	11.041	10.580	760.706	2.7916
520	13.9	10.0	1936 II	23	66.456	16.132	35.184	11.007	6.333	681.184	3.0049
521	12.1	8.7	1925 I	0	249.320	313.030	90.749	10.491	16.342	781.336	2.7422
522	12.6	7.7	1943 IX	26	10.749	244.309	119.023	4.416	4.868	514.138	3.6248
523	12.8	9.0	1938 X	19	314.254	185.516	262.035	4.307	10.214	694.278	2.9669
524	12.4	9.2	1900 I	0	109.710	76.480	327.610	8.280	7.470	829.269	2.6356
525	13.8	9.3	1904 III	19	69.374	281.533	126.399	3.248	21.778	581.342	3.3398
526	13.1	9.0	1940 X	21	277.356	352.507	138.130	2.143	7.622	640.177	3.1318
527	12.5	9.2	1914 IX	21	18.086	200.466	121.302	9.662	8.649	788.692	2.7252
S 528	12.4	7.8	1943 VIII	5	183.278	54.216	51.372	12.686	1.268	566.880	3.3963
529	13.0	9.1	1938 XI	8	4.640	330.094	65.778	11.037	5.163	676.957	3.0174
530	12.4	8.2	1943 II	2	136.174	202.551	129.570	8.449	10.898	610.371	3.2330
531	14.0	10.5	1904 IV	13	329.275	53.858	198.378	34.545	10.912	756.474	2.8021
532	9.8	6.3	1943 XI	12	220.000	74.365	108.219	16.329	10.369	769.995	2.7691
S 533	13.5	9.6	1944 I	1	260.385	27.615	181.077	6.510	2.573	689.530	2.9806
534	12.8	9.2	1919 V	24	165.980	334.962	94.136	3.325	3.267	724.232	2.8846
535	11.8	8.8	1916 III	30	39.007	59.770	85.274	6.802	1.404	861.381	2.5696
536	11.7	7.0	1943 V	17	236.415	298.467	60.196	19.391	4.787	542.893	3.4957
537	13.1	9.1	1945 I	28	191.979	181.127	121.189	9.899	13.546	661.440	3.0644
538	13.2	9.0	1941 III	7	156.191	216.954	142.665	6.519	9.665	631.921	3.1591
539	13.1	9.7	1938 II	8	106.146	94.787	275.480	6.793	12.157	782.237	2.7402
A 540	12.1	10.0	1925 I	1	193.086	335.574	202.346	5.560	5.159	1073.387	2.2190
541	12.9	9.4	1919 X	21	132.419	356.077	269.123	5.958	2.917	751.041	2.8155
542	12.8	9.0	1943 VII	4	291.312	212.542	153.541	12.033	8.161	716.286	2.9059
543	12.7	8.7	1944 III	25	107.772	109.064	296.019	8.460	8.832	661.813	3.0632
544	12.6	9.5	1900 I	0	30.661	338.983	299.136	8.320	8.760	850.293	2.5920
545	12.2	8.0	1930 IV	17	241.867	324.820	334.805	11.205	11.232	628.880	3.1693
546	12.1	9.0	1900 I	0	208.770	106.570	22.690	14.900	6.630	847.282	2.5980
547	12.7	9.2	1925 I	1	138.930	193.380	193.730	16.910	13.640	768.199	2.7735
548	13.2	10.8	1941 VI	19	205.986	318.817	108.353	3.868	10.652	1028.892	2.2825
549	13.5	10.2	1950 I	0	79.660	156.830	291.780	3.950	15.272	806.647	2.6847
550	11.9	8.8	1900 I	0	32.560	42.400	271.710	10.120	12.710	851.159	2.5900



No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
551	12.8	9.0	1944 IX	27	287.902	63.467	8.360	0.430	7.023	693.657	2.9687
552	12.2	8.0	1928 II	7	243.605	336.798	268.538	7.701	4.980	634.822	3.1495
553	13.7	11.5	1932 II	26	70.036	354.268	72.263	5.391	6.180	1065.055	2.2306
554	10.8	8.2	1918 IX	3	305.848	124.725	296.447	2.940	8.856	969.458	2.3749
555	13.9	9.7	1940 V	4	90.201	352.862	130.733	2.670	9.219	630.591	3.1635
556	12.5	9.7	1900 I	0	264.880	173.610	286.620	5.240	5.8 0	916.460	2.4656
557	13.7	11.0	1900 I	0	243.710	192.210	294.030	2.497	5.880	929.791	2.4420
A 558	12.2	8.5	1925 I	1	48.095	311.696	144.643	8.350	2.435	715.415	2.9083
559	12.3	9.0	1900 I	0	253.860	125.040	113.360	9.300	3.740	794.480	2.7118
560	13.4	10.0	1944 IX	27	281.875	2.433	105.653	8.463	9.114	776.916	2.7527
561	13.9	9.7	1939 III	18	65.171	304.627	160.833	1.514	9.691	628.904	3.1692
562	12.9	9.0	1941 II	23	184.028	257.415	71.491	11.139	5.865	677.276	3.0164
A 563	11.1	7.8	1900 I	0	77.460	333.620	86.030	10.240	13.690	793.724	2.7137
564	13.7	10.3	1932 IV	7	291.609	213.428	71.286	18.076	15.651	778.296	2.7495
565	12.9	10.2	1900 I	0	288.110	288.200	226.480	10.900	7.530	928.977	2.4434
A 566	12.0	7.5	1943 VII	9	275.172	309.093	80.719	4.947	5.929	568.915	3.3882
567	13.1	9.0	1944 V	30	61.932	130.171	59.356	9.240	4.624	637.506	3.1406
568	12.3	8.6	1933 VIII	29	190.563	171.645	250.327	18.364	9.717	725.531	2.8812
569	12.4	9.2	1938 III	23	103.879	139.008	303.188	1.290	10.463	819.098	2.6574
570	12.7	8.1	1944 X	31	17.131	156.135	227.259	1.744	6.377	559.678	3.4254
571	13.8	11.2	1900 I	0	151.309	24.521	3.861	5.299	13.983	948.325	2.4101
572	12.9	10.5	1900 I	0	151.880	189.560	195.140	10.540	9.020	953.871	2.4007
573	13.2	9.2	1944 II	2	108.070	29.510	343.634	9.859	6.156	676.865	3.0176
574	14.3	12.0	1922 XI	12	352.605	73.530	337.616	5.718	13.818	1049.519	2.2526
575	13.5	10.5	1900 I	0	245.130	332.130	350.370	15.060	7.350	868.813	2.5550
576	12.7	8.8	1944 I	31	171.370	24.591	300.755	10.289	10.976	684.416	2.9954
577	13.0	8.9	1944 XI	25	100.435	325.108	330.240	5.274	8.885	646.334	3.1119
578	12.0	8.6	1939 I	22	203.792	257.967	30.693	6.170	11.244	778.540	2.7488
S 579	11.5	7.6	1944 II	21	212.085	230.264	83.285	11.077	4.204	677.112	3.0169
580	13.7	9.4	1941 II	2	68.535	309.134	99.560	3.664	6.711	615.548	3.2147
581	13.7	9.4	1940 X	11	55.145	308.061	102.973	21.831	1.471	615.155	3.2162
582	12.6	9.5	1938 X	2	286.996	309.348	155.807	30.000	13.053	841.677	2.6096
583	13.1	8.9	1925 I	0	43.400	245.308	261.263	8.283	8.704	624.398	3.1844
584	11.5	8.9	1930 IX	6	351.834	83.433	282.703	10.724	13.472	970.065	2.3739
585	12.7	10.0	1950 I	0	213.690	327.870	180.590	7.510	7.540	936.552	2.4302
586	12.9	9.0	1938 II	27	40.032	244.702	230.685	1.593	4.048	669.440	3.0399
587	14.3	11.8	1906 III	19	2.059	187.156	324.793	24.973	9.583	994.165	2.3354
S 588	14.2	7.7	1941 II	2	17.219	127.827	316.101	10.316	8.616	298.233	5.2116
589	12.7	8.6	1925 I	1	273.075	217.136	179.296	10.782	2.282	639.639	3.1345
590	13.1	9.2	1927 V	3	107.179	338.137	106.765	11.143	4.573	682.891	2.9999
591	13.5	10.3	1942 VII	20	88.041	215.753	334.921	12.559	12.042	810.164	2.6768
592	12.8	8.9	1939 VI	6	210.367	253.571	169.126	10.154	7.918	676.247	3.0195
593	12.4	9.1	1900 I	0	264.180	27.590	77.200	17.000	12.400	800.112	2.6992
594	15.0	11.8	1943 IV	24	228.410	76.838	155.358	32.604	20.474	832.245	2.6293
595	12.1	7.8	1939 II	9	204.172	252.525	25.193	17.851	4.315	619.129	3.2025
596	12.0	8.2	1946 II	15	284.199	173.943	71.178	14.656	9.476	708.020	2.9285
597	12.8	9.5	1924 VII	2	310.872	304.753	37.209	12.811	8.228	812.116	2.6726
598	12.0	8.5	1925 I	0	183.630	288.920	92.670	12.189	14.455	772.897	2.7622
599	12.4	8.9	1925 I	1	292.899	291.191	45.607	16.613	17.138	768.579	2.7725
600	13.0	9.8	1900 I	0	199.320	108.460	140.220	10.200	3.070	817.834	2.6600

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
601	12.6	8.5	1943	III	17	178.170	158.150	170.066	16.101	6.262	639.412 3.1344
602	12.1	8.0	1938	I	20	71.960	41.999	332.805	15.215	13.647	649.958 3.1003
603	13.9	10.9	1900	I	0	182.506	154.127	344.283	8.028	9.822	871.097 2.5505
604	12.4	8.2	1945	I	25	67.547	26.630	12.980	4.433	10.421	630.418 3.1641
605	12.9	9.0	1937	X	24	38.853	12.440	343.278	19.666	7.769	682.398 3.0013
606	12.9	9.8	1900	I	0	134.016	54.312	319.949	8.683	12.681	852.425 2.5877
607	12.6	9.0	1918	II	19	280.374	288.700	286.257	10.088	4.475	736.802 2.8517
608	14.1	10.2	1942	VII	20	297.605	67.437	294.668	9.374	6.790	674.113 3.0259
609	12.8	8.8	1934	V	31	112.365	122.275	166.265	4.147	2.026	653.676 3.0886
610	15.6	11.6	1942	V	1	209.601	350.997	20.990	13.088	14.763	656.500 3.0797
611	12.3	8.4	1939	II	22	51.990	254.359	190.333	13.407	6.973*	689.747 2.9800
612	14.6	10.4	1906	X	9	24.381	116.310	205.785	20.492	15.462	636.959 3.1424
613	13.0	9.3	1945	VIII	13	254.689	63.224	355.185	7.670	3.583	711.389 2.9192
614	13.7	10.4	1919	IX	3	299.931	206.582	218.019	6.996	6.299	802.264 2.6944
A 615	12.6	9.4	1900	I	0	270.150	242.400	14.650	2.770	6.390	831.146 2.6316
616	12.7	9.7	1900	I	0	49.570	105.860	356.660	15.000	3.410	869.943 2.5527
S 617	12.6	5.9	1940	X	9	353.645	303.410	43.934	22.103	8.130	299.717 5.1943
618	12.4	8.2	1945	VII	20	307.744	244.184	111.473	17.007	4.739	623.700 3.1868
619	12.1	9.2	1900	I	0	142.400	174.600	188.420	13.740	4.370	886.799 2.5203
620	13.6	10.9	1900	I	0	129.740	333.090	0.860	7.770	7.660	933.328 2.4358
621	13.9	9.8	1942	V	1	129.029	30.373	67.485	2.357	7.883	641.457 3.1277
622	12.8	10.1	1917	IX	15	329.798	254.035	142.956	8.641	14.032	945.316 2.4152
623	12.8	10.0	1900	I	0	111.540	123.030	309.120	14.170	6.550	919.333 2.4604
S 624	13.2	6.4	1940	XII	19	293.458	177.001	342.152	18.267	1.613	304.721 5.1373
625	12.1	8.9	1950	I	0	168.883	198.759	127.748	12.093	12.977	823.989 2.6469
626	11.4	8.4	1922	XII	15	35.555	42.387	342.021	25.454	14.041	859.549 2.5733
627	13.1	9.3	1933	V	21	293.478	177.613	143.053	6.449	3.383	718.676 2.8995
A 628	12.2	9.2	1900	I	0	294.050	201.720	112.690	11.541	2.453	855.232 2.5820
629	13.8	9.7	1946	I	20	23.677	31.984	87.746	9.322	8.819	641.364 3.1280
630	13.5	10.3	1950	I	0	35.080	37.780	105.710	13.900	6.500	834.894 2.6237
631	12.3	8.8	1921	IV	28	68.920	276.906	225.621	18.830	4.811	760.172 2.7929
632	14.5	11.3	1900	I	0	97.310	247.060	358.770	2.262	11.080	816.653 2.6626
633	12.9	9.0	1937	II	1	153.372	188.894	147.937	10.906	4.947	676.596 3.0184
634	13.1	9.1	1937	II	1	113.825	220.407	134.084	12.288	10.494	666.462 3.0489
S 635	12.6	8.5	1944	I	19	58.589	227.295	183.961	10.979	4.688	637.307 3.1413
636	12.4	8.7	1937	III	10	185.976	296.589	35.429	7.939	9.975	714.847 2.9098
637	14.0	9.8	1941	III	21	12.612	164.666	357.000	0.324	6.799	631.934 3.1591
638	13.5	10.1	1943	III	28	337.124	127.194	103.655	7.708	9.182	784.808 2.7342
639	12.1	8.2	1943	V	25	271.534	65.216	280.666	8.559	6.327	678.516 3.0127
640	13.0	8.8	1936	XI	13	149.283	18.737	236.156	13.374	3.923	630.670 3.1632
641	14.5	12.3	1925	I	1	30.102	16.416	41.106	1.733	7.392	1072.666 2.2200
642	13.5	9.3	1934	I	13	122.898	110.525	7.776	8.193	8.481	627.618 3.1735
S 643	13.9	9.4	1945	XII	16	352.206	210.628	255.110	13.902	5.485	581.259 3.3401
644	13.1	10.0	1900	I	0	66.090	267.510	108.940	1.040	8.980	846.504 2.5997
645	13.5	9.3	1939	V	5	119.839	87.782	0.990	7.063	9.920	623.667 3.1869
646	14.5	12.1	1950	I	0	346.145	36.155	303.047	6.945	12.327	1000.813 2.3251
647	13.5	10.8	1939	I	15	24.619	173.639	254.826	7.299	10.956	928.740 2.4439
648	13.1	8.9	1938	IV	7	72.117	168.389	292.933	9.989	13.102	628.555 3.1704
649	15.1	12.1	1900	I	0	44.768	347.088	357.887	12.680	16.053	871.566 2.5495
650	14.7	11.9	1907	X	5	3.071	175.990	216.357	2.555	10.770	918.478 2.4620

No.	m	g	Epoch	$O^hUT$	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
651	13.5	9.6	1939 V	31	18.968	347.678	38.785	10.785	5.533	675.059	3.0230
652	13.3	10.3	1900 I	0	70.860	274.840	86.870	15.730	7.320	868.561	2.5555
653	12.9	9.0	1938 XI	24	211.218	55.566	133.709	11.281	2.586	678.912	3.0116
A 654	11.1	8.7	1925 I	1	303.113	212.451	278.686	18.166	13.317	1019.110	2.2972
655	12.6	8.7	1940 II	24	83.548	278.864	130.653	6.496	4.838	686.444	2.9895
656	13.6	9.5	1942 II	10	358.518	324.503	186.150	0.468	6.573	629.667	3.1666
657	13.7	10.6	1943 VII	15	94.495	243.806	298.171	10.172	6.559	841.029	2.6109
658	13.6	10.0	1926 VII	19	1.149	57.320	352.641	1.529	3.655	735.842	2.8542
S 659	14.4	7.7	1941 III	3	155.231	333.357	350.559	4.523	6.253	296.496	5.2319
A 660	10.6	7.6	1900 I	0	226.230	104.490	157.700	15.240	6.030	879.359	2.5345
661	12.7	8.8	1936 VIII	4	150.694	179.883	336.576	9.284	2.314	677.909	3.0146
662	13.3	10.3	1900 I	0	286.070	163.170	134.130	4.100	12.510	869.239	2.5541
663	13.0	9.0	1930 I	1	80.564	310.059	233.878	17.789	9.011	662.311	3.0617
664	14.2	10.0	1937 VIII	16	72.778	88.363	176.230	8.533	14.389	631.907	3.1592
665	12.8	8.7	1941 VI	15	6.966	311.681	300.161	14.646	10.027	635.951	3.1457
666	13.6	10.5	1900 I	0	295.400	171.040	216.200	7.570	13.820	849.610	2.5934
667	13.4	9.2	1940 IV	1	53.813	309.007	153.378	25.435	10.154	620.445	3.1979
668	15.0	11.5	1936 VIII	1	347.369	109.509	215.851	6.823	13.205	758.188	2.7978
669	13.7	9.8	1945 X	8	76.382	117.358	171.278	10.752	4.618	678.724	3.0121
670	13.4	9.9	1945 VI	18	281.110	193.067	175.109	7.535	11.256	756.718	2.8014
671	13.1	9.0	1929 VII	11	206.263	95.484	1.772	8.031	3.732	652.209	3.0932
672	13.3	10.3	1900 I	0	7.170	306.120	344.920	11.111	7.815	868.589	2.5554
673	13.0	9.4	1908 IX	25	265.970	228.179	228.838	2.826	0.629	750.907	2.8159
674	10.7	7.0	1925 I	1	36.286	38.796	59.329	13.614	11.178	709.672	2.9239
675	11.2	7.8	1925 I	1	149.675	148.987	264.171	9.766	11.765	769.633	2.7700
676	12.5	8.5	1946 I	20	150.374	179.472	150.976	12.823	7.489	664.272	3.0557
677	12.9	9.2	1941 VI	19	68.606	275.083	273.657	8.485	2.868	698.252	2.9557
678	12.6	9.6	1900 I	0	349.580	117.560	282.690	6.068	12.645	859.411	2.5735
679	10.9	7.8	1936 X	19	329.663	265.807	112.718	24.418	17.977	852.857	2.5867
680	13.2	8.9	1934 XII	14	147.928	241.275	40.376	17.830	17.025	638.632	3.1368
681	14.3	10.2	1936 IV	20	276.453	115.639	179.078	12.545	5.810	648.312	3.1056
682	14.8	11.6	1909 VI	21	344.112	99.490	192.204	11.468	9.700	826.032	2.6425
S 683	12.4	8.3	1944 XII	24	275.868	281.001	260.422	18.494	3.337	645.732	3.1139
684	13.5	10.8	1950 I	0	279.590	290.860	336.520	5.530	2.101	935.952	2.4313
685	13.5	11.2	1909 VIII	17	10.036	78.488	236.005	3.636	11.318	1061.169	2.2360
686	13.9	10.8	1945 II	10	182.810	86.920	243.861	15.666	15.452	850.499	2.5915
687	14.8	11.4	1950 I	0	326.250	51.500	335.090	14.970	15.730	789.751	2.7228
688	13.5	10.2	1950 I	0	63.131	138.008	171.270	10.149	7.967	800.274	2.6993
689	14.2	11.8	1909 IX	13	1.318	186.464	168.451	5.729	13.347	1006.750	2.3159
690	11.8	7.7	1936 X	21	316.213	111.221	254.808	11.196	9.777	632.592	3.1568
691	12.8	8.9	1943 IV	27	189.284	299.538	88.706	13.094	7.271	679.987	3.0085
S 692	13.3	8.8	1941 II	25	73.547	47.892	65.224	26.457	10.726	578.253	3.3517
693	12.8	9.0	1909 IX	27	85.918	289.985	352.943	14.199	1.514	702.329	2.9443
694	12.4	9.1	1944 XI	16	48.520	109.357	231.118	15.789	18.863	812.984	2.6707
695	11.2	8.2	1900 I	0	252.220	77.240	276.230	13.930	9.110	876.910	2.5393
696	13.2	9.0	1938 IV	11	18.756	102.418	300.952	13.043	12.999	619.317	3.2018
A 697	12.5	8.8	1944 II	12	130.680	331.285	16.046	15.112	8.790	723.950	2.8853
698	13.8	10.2	1937 XI	14	276.179	96.224	41.423	11.555	6.370	730.937	2.8669
699	14.5	11.4	1943 III	23	233.961	89.633	243.893	15.251	24.031	839.104	2.6149
700	13.1	10.9	1923 III	13	346.671	99.062	97.070	6.796	5.925	1065.779	2.2296

No.	m	g	Epoch	$0^h$ UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
						1950.0					
	701	13.1 9.2	1941 VI	19	55.082	317.238	244.598	7.080	2.177	677.811	3.0149
	702	12.0 7.8	1944 VII	27	325.106	43.574	290.221	20.618	1.861	621.978	3.1926
	703	13.9 11.9	1925 I	1	147.193	173.192	213.940	2.437	7.948	1106.238	2.1749
S	704	10.3 6.3	1944 I	19	82.724	92.684	281.367	17.336	8.378	661.322	3.0647
	705	12.1 8.3	1934 VIII	7	205.603	99.701	3.245	25.056	3.108	710.600	2.9214
	706	13.9 10.5	1941 VI	15	299.961	28.199	325.881	14.490	11.065	786.889	2.7294
	707	13.6 11.6	1926 XII	27	58.639	88.754	282.454	4.270	6.189	1102.078	2.1804
	708	13.2 10.0	1900 I	0	115.472	193.914	356.245	3.518	4.785	812.942	2.6707
	709	12.1 8.4	1941 II	15	159.382	14.992	324.942	16.332	6.650	713.939	2.9123
	710	14.1 10.0	1942 XII	11	209.894	94.482	140.727	1.721	7.271	639.502	3.1341
	711	13.0 10.8	1924 I	29	195.411	298.169	357.657	6.096	11.283	1060.222	2.2374
	712	11.5 8.3	1914 XI	12	0.405	179.474	231.441	12.745	10.755	858.280	2.5758
S	713	12.9 8.3	1939 XI	26	56.372	127.609	220.530	10.143	8.296	563.039	3.4118
A	714	11.3 8.3	1900 I	0	174.670	228.570	234.680	14.340	3.140	878.898	2.5354
	715	13.2 9.8	1920 IV	25	227.977	298.078	46.801	13.836	4.932	770.305	2.7684
	716	13.4 9.9	1934 X	29	89.713	49.439	147.049	8.465	5.209	753.674	2.8089
	717	14.0 9.9	1931 IV	24	175.396	16.325	346.615	1.756	15.335	639.713	3.1335
	718	12.8 8.8	1944 XI	6	213.277	172.455	39.238	6.977	11.740	665.978	3.0504
	719	17.6 14.5	1911 X	2	7.929	151.940	186.094	10.825	32.722	853.665	2.5852
	720	13.0 9.3	1925 I	1	120.183	109.188	36.637	2.396	0.950	723.035	2.8878
S	721	14.0 9.2	1945 XI	11	17.107	353.583	40.276	8.372	6.545	529.438	3.5546
	722	13.5 11.5	1925 I	1	118.890	255.149	45.980	5.665	8.314	1108.456	2.1720
	723	13.3 9.4	1939 I	20	80.504	247.343	164.096	4.966	3.178	684.869	2.9941
	724	15.5 12.8	1911 X	22	351.939	203.218	204.845	11.599	14.640	935.489	2.4321
	725	13.5 10.5	1923 VII	3	302.372	320.994	69.068	3.801	12.814	860.106	2.5722
	726	13.4 10.7	1926 III	29	216.295	111.289	242.916	15.370	16.581	863.148	2.5661
	727	12.7 9.7	1941 II	18	91.195	272.105	133.374	15.021	6.000	862.609	2.5672
	728	14.3 12.0	1912 III	11	2.325	66.577	82.014	4.244	5.298	1036.278	2.2717
	729	12.9 9.4	1940 IV	10	355.145	85.040	124.932	18.065	5.486	773.787	2.7601
	730	14.7 12.5	1912 V	11	0.491	120.706	95.352	4.232	10.225	1055.373	2.2442
	731	12.7 8.8	1944 V	30	307.300	284.985	47.178	10.689	8.195	687.880	2.9854
	732	13.1 10.3	1932 VIII	26	81.490	58.764	173.791	11.017	2.269	921.321	2.4570
S	733	13.0 8.5	1946 I	31	334.799	167.029	342.552	20.267	4.020	566.637	3.3973
	734	13.4 9.2	1939 VIII	17	264.422	56.774	4.921	5.848	5.948	635.987	3.1456
	735	12.4 9.0	1928 III	18	184.137	307.082	44.095	16.718	18.863	786.260	2.7309
	736	12.3 10.2	1912 X	17	63.036	199.049	135.952	4.368	9.452	1085.840	2.2021
	737	11.2 8.1	1928 VII	1	347.002	131.889	185.579	12.291	13.951	850.122	2.5923
	738	13.4 9.5	1938 XI	20	252.198	45.217	132.596	3.525	3.581	671.846	3.0327
	739	12.2 8.8	1943 XII	6	265.393	42.309	137.004	20.740	8.246	784.477	2.7350
	740	12.6 8.6	1938 XII	10	287.959	48.546	116.759	10.858	6.537	666.571	3.0486
	741	13.0 9.6	1929 XI	8	253.203	58.522	101.243	8.421	3.952	790.464	2.7211
	742	12.5 8.6	1939 II	2	133.127	281.390	65.205	11.227	6.436	677.787	3.0149
	743	13.0 9.5	1950 I	0	57.670	182.820	229.930	4.810	3.420	759.968	2.7934
	744	13.6 9.4	1943 VII	9	101.744	35.492	143.132	7.666	5.899	624.470	3.1842
	745	13.6 9.3	1943 V	8	113.769	336.870	127.057	13.590	4.880	608.446	3.2398
	746	12.5 8.4	1940 II	12	194.791	304.271	3.206	17.405	14.001	647.897	3.1070
	747	11.0 7.2	1940 VI	8	173.935	274.671	130.954	18.145	19.892	682.316	3.0016
S	748	13.5 8.2	1945 IV	10	97.652	185.295	266.001	2.243	10.251	452.438	3.9473
	749	13.5 11.3	1930 VI	19	14.399	127.180	110.024	5.384	9.970	1055.760	2.2437
	750	13.8 11.1	1913 IV	29	64.886	66.957	70.064	3.974	8.127	928.530	2.4442

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
751	11.5	8.5	1940 X	21	102.199	300.322	78.994	15.539	8.877	870.682	2.5513
752	13.0	10.2	1900 I	0	302.210	22.350	85.310	5.980	4.070	917.682	2.4634
753	13.3	10.9	1930 I	7	222.103	201.493	61.722	10.124	12.747	998.158	2.3292
754	12.8	8.9	1930 IV	18	74.832	298.201	180.524	24.511	2.846	687.035	2.9878
755	13.3	9.1	1944 X	1	137.030	48.345	177.466	3.226	8.677	628.841	3.1694
756	13.9	9.6	1931 IV	3	345.686	358.890	209.108	19.955	6.564	609.345	3.2367
757	12.6	10.0	1950 I	0	58.600	42.880	22.450	8.190	6.280	970.470	2.3733
S 758	11.3	7.0	1943 XII	18	359.131	319.498	106.679	5.612	7.098	617.512	3.2081
759	13.8	10.7	1900 I	0	287.030	358.000	319.312	20.032	11.840	837.694	2.6179
760	11.9	7.7	1925 X	20	240.628	191.867	333.839	12.806	13.431	635.886	3.1459
761	13.7	10.1	1941 V	6	287.105	295.251	24.700	2.188	3.594	732.098	2.8639
762	11.7	7.5	1939 IV	9	78.066	179.734	306.901	13.127	6.404	634.156	3.1517
763	14.6	12.4	1928 I	26	89.056	87.558	290.555	4.085	9.525	1057.633	2.2410
764	13.2	9.0	1938 II	7	53.817	166.020	259.999	10.074	6.178	623.972	3.1857
765	15.1	12.1	1921 IX	20	329.707	71.125	327.419	5.574	16.541	873.578	2.5457
766	12.9	9.0	1944 VIII	15	269.573	64.713	8.816	10.068	5.258	674.974	3.0233
767	13.8	9.7	1934 V	4	276.931	264.182	80.215	2.432	10.125	642.336	3.1249
768	14.0	9.8	1943 III	17	80.689	11.820	39.820	16.414	12.251	640.244	3.1317
S 769	12.8	8.6	1945 IV	1	275.203	240.190	41.223	7.510	9.392	621.999	3.1926
770	13.0	10.8	1916 VIII	26	293.192	16.513	44.856	4.401	8.715	1072.064	2.2208
771	13.4	10.2	1900 I	0	274.830	224.740	219.260	14.988	14.223	821.152	2.6529
772	12.1	8.2	1938 X	27	180.327	143.599	64.008	28.762	5.536	683.475	2.9981
773	12.4	8.8	1939 II	8	209.137	330.134	322.889	16.707	4.620	734.257	2.8582
774	12.5	8.5	1941 VI	19	197.158	27.663	251.165	5.569	9.749	667.945	3.0445
775	13.7	9.8	1939 VII	9	324.339	169.321	298.665	9.284	3.861	678.952	3.0116
776	11.0	7.2	1937 VI	24	328.505	304.341	80.445	18.206	9.316	705.987	2.9341
777	13.9	9.6	1932 III	27	18.759	236.547	287.152	13.070	7.410	618.818	3.2035
778	14.1	9.9	1938 IV	28	125.912	123.895	324.870	13.360	16.017	631.255	3.1613
A 779	11.5	8.2	1900 I	0	63.070	46.370	284.680	14.641	12.902	815.156	2.6659
780	12.7	8.6	1941 I	2	85.523	211.070	145.446	19.056	5.541	645.882	3.1134
781	13.1	8.8	1937 I	20	196.598	136.568	140.085	18.915	4.516	607.212	3.2442
782	13.0	11.0	1914 III	19	22.039	80.341	80.599	5.266	2.228	1102.387	2.1800
783	13.2	10.7	1932 I	1	261.387	152.983	142.368	9.297	13.224	989.410	2.3429
784	13.1	9.0	1944 XI	6	167.574	234.342	16.689	12.470	13.792	651.047	3.0969
A 785	12.6	9.6	1900 I	0	180.501	127.437	72.915	12.687	11.920	859.715	2.5729
786	13.0	8.8	1945 XI	1	177.793	139.175	89.843	14.574	9.411	627.771	3.1730
787	12.8	9.8	1900 I	0	90.740	123.410	184.690	14.917	7.321	876.642	2.5397
788	12.6	8.5	1939 IX	2	211.710	43.263	178.450	14.306	7.634	643.356	3.1215
789	14.1	10.8	1900 I	0	256.263	39.430	233.816	10.762	8.364	805.719	2.6867
S 790	12.7	8.1	1944 III	4	252.122	37.973	252.901	20.657	9.771	569.664	3.3853
791	13.7	9.6	1939 I	14	127.233	197.906	130.721	16.410	11.144	643.342	3.1216
792	12.8	9.7	1950 I	0	72.230	224.860	265.610	8.640	7.600	835.628	2.6222
793	12.5	9.0	1939 III	1	169.470	306.675	36.628	15.841	7.055	758.474	2.7971
794	14.6	10.5	1936 IX	12	32.807	121.666	164.689	5.219	17.134	638.357	3.1378
795	12.6	9.2	1925 I	1	238.840	186.870	17.900	19.100	5.737	777.936	2.7503
796	12.2	9.0	1900 I	0	210.554	326.954	34.171	18.968	18.827	829.773	2.6345
797	12.5	9.5	1900 I	0	282.690	350.690	239.870	4.470	3.260	878.341	2.5365
798	12.9	9.0	1934 IX	24	93.321	45.637	215.415	9.236	1.902	677.423	3.0160
799	12.8	9.8	1925 X	11	351.149	231.543	165.393	5.237	1.320	875.676	2.5416
800	12.9	10.8	1919 VIII	20	9.124	345.299	325.529	4.262	11.578	1092.739	2.1927



No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
801	13.9	10.8	1941 VI	19	99.284	333.182	186.212	14.098	4.432	843.684	2.6054
802	13.7	11.6	1915 III	20	55.671	107.652	8.056	5.240	4.767	1090.075	2.1963
S 803	13.1	9.0	1944 III	24	216.161	75.930	252.029	8.611	1.767	617.609	3.2077
804	11.2	7.6	1950 I	0	311.080	340.910	348.120	15.340	8.050	741.637	2.8393
805	12.9	8.8	1939 V	31	328.019	132.572	167.874	15.639	8.827	612.752	3.2247
806	13.5	9.3	1939 VII	4	126.431	96.190	45.848	14.182	6.017	621.430	3.1945
807	13.5	9.5	1939 XII	2	324.124	338.155	132.763	11.256	3.397	676.819	3.0178
808	13.1	9.7	1950 I	0	143.130	272.210	181.570	4.700	7.430	779.978	2.7455
809	13.6	11.3	1950 I	0	330.150	195.040	154.240	7.154	11.059	1028.446	2.2832
810	14.4	12.3	1915 IX	10	356.230	196.685	152.620	2.595	10.600	1095.491	2.1891
811	13.6	9.9	1945 XI	1	70.035	179.329	130.787	3.104	4.287	719.765	2.8965
812	13.9	10.7	1900 I	0	135.831	347.995	8.215	13.398	9.611	818.077	2.6595
813	13.1	11.0	1921 VII	13	291.998	311.394	52.112	6.312	1.481	1070.546	2.2231
814	12.6	8.4	1941 VI	19	232.813	294.246	90.221	21.607	17.021	624.557	3.1839
815	13.6	10.4	1941 VI	19	321.805	55.075	57.444	13.900	4.282	817.524	2.6608
816	13.7	9.8	1942 I	19	352.839	18.271	128.317	14.306	5.811	680.719	3.0063
817	13.4	10.3	1900 I	0	102.133	282.163	126.587	11.336	10.410	851.338	2.5898
818	13.0	8.8	1945 III	10	161.045	298.712	71.524	15.657	4.289	624.964	3.1825
819	13.4	11.3	1941 VI	19	163.963	304.613	333.360	4.898	8.131	1088.612	2.1983
820	13.2	9.2	1938 III	18	227.103	190.338	119.315	5.920	2.832	640.650	3.1303
821	14.0	10.5	1944 V	2	352.177	30.457	210.727	5.349	11.872	766.709	2.7771
822	13.4	11.2	1926 II	20	45.930	244.752	211.000	0.695	8.917	1047.468	2.2555
823	13.7	11.6	1916 IV	2	68.972	216.831	255.536	3.638	5.166	1071.510	2.2216
824	13.0	9.5	1936 IX	14	54.030	136.792	142.166	8.053	7.820	760.529	2.7921
825	13.0	10.8	1941 VI	19	197.160	109.795	101.040	3.394	4.266	1067.798	2.2267
826	13.3	10.0	1936 VIII	21	150.731	33.091	230.921	7.108	11.501	792.472	2.7166
827	14.8	12.5	1916 VIII	30	346.300	193.676	173.067	3.405	9.020	1034.195	2.2748
828	13.7	9.5	1943 IV	26	275.873	315.688	2.900	1.151	3.060	623.759	3.1866
829	13.1	10.1	1900 I	0	307.723	38.900	353.581	8.320	5.678	856.143	2.5801
830	12.0	7.9	1941 I	18	32.576	65.410	342.617	3.880	5.478	619.964	3.1996
831	13.9	11.8	1916 IX	23	328.278	223.646	178.274	4.824	8.474	1076.807	2.2144
832	13.4	9.8	1950 I	0	300.080	116.730	256.040	0.991	4.690	731.754	2.8649
833	14.0	10.0	1942 VIII	29	326.473	33.459	353.759	9.804	7.723	678.460	3.0129
834	12.7	8.5	1944 VIII	6	32.115	91.791	183.442	3.935	12.742	631.375	3.1609
835	13.8	9.6	1945 XI	5	19.931	59.965	310.828	3.707	7.205	620.080	3.1993
836	14.3	12.3	1900 I	0	287.599	177.828	200.094	4.833	10.131	1094.719	2.1901
837	13.5	11.1	1916 X	28	355.853	171.687	200.328	6.717	2.357	1018.490	2.2981
838	13.1	9.4	1938 II	13	131.606	115.789	240.908	10.396	7.520	718.456	2.9000
839	13.0	9.9	1950 I	0	355.260	337.530	338.410	12.530	8.860	839.013	2.6152
840	13.0	8.9	1939 IX	19	128.302	8.464	273.638	9.945	5.032	642.708	3.1236
841	13.2	11.0	1928 IV	10	45.438	118.877	355.061	3.795	4.040	1047.578	2.2553
842	13.7	9.4	1945 XI	1	22.092	358.014	6.379	14.565	8.635	616.081	3.2130
843	14.7	12.4	1916 X	1	28.492	315.199	4.542	7.993	12.081	1031.150	2.2793
844	12.8	8.6	1945 XII	11	88.834	344.730	349.566	8.853	5.696	623.168	3.1886
845	13.1	9.3	1941 VI	19	29.163	291.595	43.914	12.680	3.636	704.151	2.9392
846	13.9	9.8	1940 II	15	95.615	113.838	273.781	0.244	10.199	640.391	3.1312
847	13.1	9.6	1941 II	18	121.488	125.429	272.367	2.472	5.376	764.424	2.7826
848	14.1	10.0	1937 VIII	27	18.168	121.358	210.247	1.010	9.718	648.383	3.1054
849	11.6	7.4	1946 III	1	246.652	56.700	229.713	19.609	11.229	634.798	3.1495
850	13.0	9.1	1941 VI	19	248.366	131.462	121.809	15.472	7.496	684.233	2.9960



No.	m g		Epoch 0 <sup>h</sup> UT M			$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
						1950.0					
851	13.5	11.3	1916 IV	5	45.929	5.977	141.127	2.383	5.203	1066.575	2.2285
852	12.7	10.2	1941 VI	19	262.894	280.994	27.638	23.018	15.938	977.224	2.3623
853	13.5	11.1	1916 IV	5	328.133	57.856	183.333	9.258	6.017	1008.727	2.3129
854	14.0	11.4	1941 VI	19	270.777	82.026	191.012	6.079	10.021	974.248	2.3672
855	13.5	11.0	1938 V	22	355.469	232.872	17.385	10.906	10.306	977.989	2.3611
856	13.2	10.5	1916 IV	4	358.274	70.813	126.029	14.332	6.838	933.432	2.4357
857	13.2	11.1	1941 VI	19	172.432	237.648	82.766	5.309	5.090	1094.816	2.1900
858	13.6	10.1	1916 VI	3	8.840	173.774	67.979	8.990	6.120	753.903	2.8084
859	12.8	8.6	1944 VIII	18	299.121	1.224	37.158	13.749	7.736	617.694	3.2074
A 860	12.8	9.3	1941 VI	19	227.587	18.319	309.987	13.341	6.205	758.816	2.7962
861	12.9	8.7	1923 IV	14	224.562	188.914	116.166	8.047	5.846	637.989	3.1390
A 862	12.8	9.3	1941 II	15	96.624	117.452	300.565	13.917	4.730	755.982	2.8033
863	12.9	8.7	1943 X	3	126.751	114.766	117.162	25.457	2.898	621.181	3.1954
864	14.1	11.3	1917 II	17	341.460	70.812	91.595	7.139	12.147	920.435	2.4586
865	14.1	11.4	1950 I	0	286.960	300.130	177.310	13.260	11.380	944.437	2.4167
866	12.6	8.5	1939 II	15	137.218	258.891	92.167	8.687	3.037	642.020	3.1259
867	14.0	10.0	1945 V	26	123.781	68.412	47.638	6.015	7.707	662.581	3.0609
868	12.7	9.4	1917 V	11	162.307	284.033	116.618	5.824	8.482	797.880	2.7042
869	14.4	11.1	1932 XII	12	164.453	103.014	156.331	7.809	12.578	804.283	2.6899
870	13.5	11.1	1925 I	1	356.448	194.726	120.979	6.198	15.352	1003.014	2.3217
871	14.4	11.8	1930 IV	1	319.000	64.792	158.063	4.251	6.762	1071.850	2.2212
872	13.3	9.9	1934 I	9	264.016	17.671	195.447	7.367	4.637	785.823	2.7318
873	14.1	11.0	1930 VI	30	11.282	105.998	150.909	5.255	8.300	832.828	2.6280
874	13.4	9.2	1934 VI	18	71.411	356.142	192.091	11.118	4.457	633.346	3.1543
875	13.8	10.8	1928 XII	23	237.606	116.726	196.354	14.542	8.810	869.003	2.5546
876	13.9	10.0	1941 II	9	115.720	206.202	151.593	11.362	6.564	680.417	3.0071
A 877	12.9	10.1	1925 I	1	102.960	274.510	115.840	4.270	8.980	904.438	2.4874
878	16.9	14.3	1916 IX	24	11.237	187.743	172.951	2.041	13.201	976.300	2.3638
879	13.9	11.0	1917 VII	24	313.336	95.019	270.567	13.771	8.917	877.014	2.5391
880	14.9	11.0	1937 V	21	264.274	96.498	264.777	15.091	18.886	683.398	2.9984
881	14.8	11.7	1936 XII	21	206.814	40.139	277.593	14.214	11.962	840.494	2.6120
882	14.1	10.0	1933 XII	17	308.380	120.075	259.457	6.000	15.482	642.682	3.1237
883	13.7	11.5	1917 X	4	28.928	40.165	286.112	4.726	11.428	1059.614	2.2383
S 884	14.0	7.3	1940 VII	31	47.591	330.467	301.102	8.873	6.896	296.542	5.2313
885	13.7	9.6	1938 VI	18	305.931	202.738	149.539	3.279	10.899	652.839	3.0912
886	13.5	9.3	1943 IV	13	222.304	295.758	61.073	16.690	16.624	635.241	3.1481
887	17.1	14.1	1937 XI	13	338.800	348.160	111.044	9.018	32.603	885.923	2.5220
888	12.9	9.6	1929 VII	11	239.025	296.062	124.662	13.829	11.210	795.742	2.7090
889	13.0	10.3	1926 IV	7	125.061	276.553	133.096	8.089	11.788	927.534	2.4459
890	13.5	9.6	1944 I	31	261.063	79.630	161.497	10.851	3.092	673.766	3.0269
891	13.3	9.7	1925 I	0	329.310	295.570	106.540	13.541	1.617	733.244	2.8609
892	13.2	8.9	1940 II	21	41.656	279.765	176.430	21.416	3.854	609.064	3.2376
S 893	12.9	9.0	1944 V	2	192.118	223.646	145.491	17.049	8.511	666.257	3.0496
894	13.5	9.4	1936 XI	1	82.692	110.871	191.861	12.664	6.497	644.637	3.1174
895	13.0	8.7	1939 II	8	47.871	185.356	264.764	26.056	7.825	616.405	3.2119
896	13.5	11.2	1900 I	0	266.647	359.434	254.486	8.183	9.443	1026.958	2.2853
897	13.7	10.7	1930 VII	18	13.287	20.969	258.608	14.240	5.076	874.161	2.5445
898	15.1	11.7	1950 I	0	0.260	46.370	243.000	10.285	21.693	786.987	2.7292
899	13.6	9.9	1933 XI	3	346.712	124.082	253.627	12.397	11.682	716.091	2.9064
900	14.3	11.5	1900 I	0	86.780	117.850	183.400	11.500	9.490	912.751	2.4723

No.	m	g	Epoch	$0^h$ UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			$^{\circ}$	$^{\circ}$	$^{\circ}$	$^{\circ}$	$^{\circ}$	"	
						1950.0					
901	13.5	11.3	1941 VI	19	320.206	66.372	265.601	3.446	12.726	1069.430	2.2246
902	14.5	11.7	1918 X	2	347.839	28.946	353.739	6.391	10.411	927.091	2.4468
903	13.4	9.1	1945 III	18	284.735	97.538	160.501	11.963	2.709	605.286	3.2511
904	13.5	9.6	1939 IX	17	328.454	250.357	198.702	15.225	4.895	685.217	2.9931
905	12.6	10.4	1918 XI	6	16.308	341.410	37.339	5.339	8.807	1075.470	2.2162
906	12.1	8.4	1923 XI	1	61.844	293.596	41.023	11.805	4.747	720.241	2.8953
907	12.7	9.2	1944 V	30	106.091	85.625	43.728	19.619	9.276	757.224	2.8002
908	13.3	10.5	1900 I	0	28.350	21.550	85.920	13.410	8.290	910.962	2.4755
S 909	12.6	7.8	1936 IX	29	342.287	231.747	147.845	18.753	5.958	533.297	3.5375
910	13.1	9.4	1936 IX	25	84.236	202.811	50.787	9.294	8.946	710.145	2.9226
S 911	13.6	6.9	1941 I	29	46.761	79.686	337.283	21.946	3.791	305.309	5.1307
912	11.9	7.8	1930 X	1	93.645	85.728	35.483	18.341	10.350	639.755	3.1332
913	14.2	12.1	1919 V	21	326.763	186.886	95.007	5.811	9.714	1089.288	2.1974
914	12.2	9.4	1941 VI	19	248.142	46.653	256.007	25.391	12.414	923.622	2.4529
915	13.9	11.7	1918 XII	29	35.649	37.712	9.623	5.569	8.059	1067.047	2.2278
916	13.4	10.9	1915 VIII	17	333.387	39.520	330.299	11.155	13.621	975.572	2.3650
917	13.6	11.0	1941 VI	19	9.067	358.365	343.726	5.147	11.565	965.518	2.3814
918	13.8	10.1	1944 XII	18	77.787	12.773	331.133	12.109	10.595	732.125	2.8638
919	13.8	10.3	1918 XI	24	63.787	84.504	229.811	9.761	14.638	706.498	2.9327
920	13.5	10.2	1941 VI	19	311.271	266.553	193.318	11.589	6.058	835.125	2.6232
921	13.4	9.2	1937 XII	29	155.648	60.215	207.125	16.420	10.233	628.218	3.1715
922	14.6	11.2	1900 I	0	209.508	123.262	206.598	7.236	11.086	804.235	2.6900
923	14.1	10.9	1941 VI	19	28.502	199.168	197.967	14.508	11.414	839.319	2.6145
924	12.8	8.9	1941 VI	19	113.568	217.234	150.937	9.004	9.139	705.958	2.9342
925	11.4	8.0	1920 III	11	354.063	198.420	300.150	21.130	4.697	799.620	2.7003
926	14.0	10.1	1932 I	1	43.544	170.546	49.823	16.375	10.382	688.973	2.9822
927	13.1	8.8	1944 V	22	81.974	137.989	9.096	14.629	6.529	617.529	3.2080
928	13.1	9.0	1943 V	15	65.705	17.527	130.411	17.665	7.926	636.396	3.1443
929	13.6	11.4	1920 III	11	280.507	20.648	231.683	3.899	6.464	1059.293	2.2387
930	13.5	10.7	1920 III	11	235.502	328.296	341.357	15.329	8.248	935.830	2.4315
931	13.4	9.2	1938 V	23	168.057	306.457	113.410	11.289	14.296	633.500	3.1538
932	11.5	8.8	1941 VI	19	343.416	48.078	15.207	8.132	5.260	942.196	2.4205
933	14.6	12.0	1900 I	0	199.392	10.559	141.876	5.529	9.458	973.190	2.3688
934	14.1	10.6	1938 VII	4	283.933	61.869	326.153	14.159	12.585	778.983	2.7478
935	14.4	12.2	1920 X	5	323.646	56.266	346.869	4.042	8.417	1073.379	2.2191
936	14.0	9.9	1939 I	11	144.384	248.510	63.276	2.401	9.872	639.001	2.8598
937	14.2	12.0	1900 I	0	309.296	69.559	244.514	3.695	12.544	1064.088	2.2320
938	14.6	10.4	1933 VII	30	116.414	219.544	119.787	2.660	10.867	632.989	3.1555
939	13.8	11.6	1920 XI	20	42.674	4.147	327.538	2.599	10.237	1053.498	2.2469
940	13.4	8.8	1945 XI	1	42.080	268.488	70.216	6.258	7.937	566.846	3.3965
941	14.4	10.9	1929 X	5	338.101	332.646	53.077	6.636	11.123	764.396	2.7826
942	13.9	9.7	1937 XI	6	3.889	319.042	72.399	10.533	8.944	628.566	3.1703
943	13.7	9.5	1933 II	17	19.620	0.354	114.881	12.125	12.237	643.907	3.1198
944	17.1	9.9	1937 VI	10	58.546	57.576	21.445	42.555	40.931	254.679	5.7900
945	13.2	9.9	1941 VI	19	283.710	159.928	318.278	32.816	9.377	828.051	2.6382
S 946	13.8	9.7	1945 VII	12	193.593	32.877	69.765	1.455	8.396	645.388	3.1150
947	12.3	8.8	1940 IV	14	167.565	336.364	48.835	6.697	14.325	776.148	2.7545
948	13.8	9.8	1942 II	8	350.758	159.576	358.261	8.642	8.821	668.952	3.0414
949	13.8	9.9	1942 II	16	328.325	247.267	322.621	10.734	11.440	684.498	2.9952
950	13.2	10.6	1928 I	28	330.195	346.722	181.882	23.509	9.226	971.947	2.3709

No.	m	g	Epoch 0 <sup>h</sup> UT		M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
951	13.5	11.4	1941 VI	19	162.305	128.171	253.347	4.095	9.989	1080.266	2.2096
952	13.4	9.5	1938 I	0	45.836	352.463	18.989	10.017	13.996	685.225	2.9931
953	13.5	9.9	1925 I	1	230.680	256.910	37.582	8.729	10.769	761.738	2.7891
954	14.0	9.8	1933 XII	1	85.269	146.498	164.083	1.121	9.900	640.838	3.1297
955	14.2	11.0	1900 I	0	326.047	278.795	352.810	10.673	16.919	849.588	2.5934
956	14.6	12.2	1925 I	1	358.754	123.423	193.128	5.934	11.792	1018.487	2.2981
957	13.2	9.3	1921 X	10	284.942	219.725	233.836	14.781	4.711	710.985	2.9204
S 958	14.3	8.9	1945 XII	3	346.779	100.136	344.567	5.679	11.163	454.237	3.9368
959	14.2	10.0	1938 X	1	353.548	319.829	60.350	4.479	12.771	626.614	3.1769
960	14.2	12.0	1921 X	25	36.765	86.237	249.758	3.017	9.517	1052.586	2.2482
961	13.8	10.4	1934 X	1	44.517	284.483	27.133	11.000	5.217	802.836	2.6931
962	14.3	10.5	1940 VII	25	295.342	234.993	143.250	2.535	5.835	716.785	2.9046
963	14.3	12.1	1921 XI	1	340.111	0.170	62.484	7.988	7.795	1052.903	2.2477
964	14.1	10.0	1937 X	7	350.754	8.398	31.494	9.055	6.349	664.830	3.0539
965	14.9	10.7	1925 I	13	152.810	43.449	43.039	21.712	15.689	632.438	3.1574
966	12.7	9.3	1941 VI	19	307.820	175.789	72.727	14.411	7.466	791.478	2.7188
967	14.0	11.8	1950 I	C	260.600	230.600	82.340	5.430	9.689	1068.656	2.2256
968	13.3	9.6	1943 IV	25	61.750	293.563	209.819	11.519	7.690	730.107	2.8691
969	14.5	11.7	1925 I	0	317.700	83.480	289.840	2.280	12.188	918.611	2.4618
970	14.9	11.9	1950 I	0	314.981	94.121	311.797	5.045	15.690	865.315	2.5618
971	13.0	9.7	1927 III	24	59.080	4.252	84.002	13.820	9.413	827.142	2.6401
972	13.3	9.2	1938 I	1	59.661	89.675	283.633	8.411	12.924	659.655	3.0699
973	13.5	9.1	1936 VIII	10	243.601	90.026	348.812	15.820	4.382	611.532	3.2289
974	12.9	10.0	1900 I	0	304.130	299.790	86.960	5.450	6.410	879.421	2.5344
975	13.0	9.4	1950 I	0	26.170	52.190	39.110	2.580	1.960	743.472	2.8346
976	13.3	9.0	1943 XII	22	282.364	301.490	246.181	7.593	7.403	625.793	3.1797
977	13.2	9.1	1945 VII	12	146.397	64.640	76.454	15.182	1.404	644.607	3.1175
978	13.6	9.3	1932 VI	25	184.383	136.450	216.821	21.577	12.773	615.372	3.2154
979	13.6	9.4	1938 V	5	245.820	111.867	232.082	10.030	8.548	634.865	3.1493
980	11.0	7.5	1940 XII	30	83.123	68.603	286.301	15.913	11.648	782.387	2.7398
981	14.3	10.2	1939 X	22	23.400	310.381	47.312	2.067	12.792	650.038	3.1001
982	13.3	9.2	1942 I	26	198.634	348.917	299.903	13.588	13.347	659.243	3.0712
983	13.1	8.9	1937 III	6	275.388	347.894	251.782	14.731	4.574	628.793	3.1695
984	12.9	9.3	1925 I	1	161.984	52.566	315.512	9.153	11.335	755.492	2.8045
985	14.8	12.4	1941 VI	19	145.980	59.876	290.161	3.915	17.358	1017.452	2.2996
986	13.7	9.5	1932 VII	15	294.558	261.399	94.129	14.850	11.587	640.093	3.1321
987	14.0	9.8	1941 II	5	147.985	9.296	324.176	8.997	13.714	639.673	3.1335
988	14.8	10.6	1932 VI	9	277.170	331.301	42.272	1.635	13.685	637.408	3.1409
989	14.7	11.3	1941 II	4	73.631	163.095	243.752	14.641	14.620	818.839	2.6579
990	15.8	12.4	1900 I	0	316.200	6.060	354.920	8.810	12.560	813.572	2.6694
991	15.8	11.6	1941 I	26	165.538	247.407	64.177	2.099	9.555	640.197	3.1319
992	14.6	10.6	1944 XII	28	275.947	342.707	212.978	10.838	5.446	675.358	3.0222
993	14.8	11.1	1923 II	16	42.090	246.903	185.234	1.744	2.622	731.943	2.8643
994	13.0	10.0	1900 I	0	286.690	339.060	3.290	15.400	6.560	881.552	2.5303
995	13.4	10.2	1900 I	0	107.288	119.878	222.518	13.068	9.650	838.707	2.6157
S 996	14.2	10.1	1941 VIII	6	173.819	143.997	349.295	0.687	8.069	653.264	3.0899
997	14.7	11.3	1925 I	1	121.782	48.626	247.826	10.499	10.719	812.563	2.6716
998	14.4	10.3	1939 VII	9	290.479	69.067	302.549	15.548	12.186	645.682	3.1141
999	14.3	11.1	1940 X	1	8.718	126.385	215.554	9.733	12.405	839.918	2.6132
1000	13.8	9.6	1936 XII	6	191.616	273.210	326.973	20.479	14.590	624.356	3.1845

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°		"	
						1950.0					
S 1001	13.0	8.8	1944 IV	15	168.019	146.546	260.076	9.362	8.926	624.275	3.1848
1002	14.0	10.4	1950 I	0	233.530	353.030	344.140	10.780	8.710	762.148	2.7881
1003	13.3	9.1	1943 V	15	114.435	312.328	140.760	1.844	9.077	636.886	3.1427
A 1004	13.5	8.9	1937 II	4	44.901	209.824	155.261	2.957	6.641	570.059	3.3837
1005	13.6	9.4	1938 V	23	181.705	55.157	350.208	19.189	7.320	632.950	3.1557
1006	15.1	10.9	1937 IV	18	155.063	78.027	299.839	11.049	21.095	639.709	3.1333
1007	14.1	10.7	1900 I	0	241.348	73.160	308.645	2.554	6.337	796.063	2.7083
1008	14.4	10.3	1931 II	28	99.565	18.694	21.449	8.963	4.747	653.049	3.0905
1009	17.7	14.4	1940 VIII	22	333.232	183.576	229.808	15.826	27.268	834.779	2.6238
1010	13.8	9.9	1923 XII	11	24.878	276.665	99.464	3.908	6.020	707.482	2.9299
1011	15.9	13.2	1939 III	22	24.919	352.292	132.575	5.465	20.415	959.436	2.3914
1012	14.3	11.5	1900 I	0	317.230	21.620	73.420	4.070	7.580	908.765	2.4794
1013	13.4	10.0	1950 I	0	313.760	97.360	28.080	11.880	12.220	807.274	2.6833
1014	14.9	11.3	1945 VII	4	205.964	227.592	253.588	2.289	11.443	754.808	2.8062
1015	13.0	8.7	1941 II	12	101.719	263.364	121.743	9.382	6.142	620.937	3.1962
1016	13.5	11.3	1924 II	1	67.867	51.241	9.152	6.056	7.409	1072.781	2.2199
1017	13.7	10.5	1900 I	0	72.555	65.447	119.158	7.888	4.407	843.234	2.6064
1018	12.4	9.4	1900 I	0	175.886	339.741	359.950	7.650	14.143	876.876	2.5393
1019	13.4	12.2	1924 III	14	259.187	121.198	144.244	26.972	4.104	1342.468	1.9116
1020	14.1	10.5	1924 IV	8	307.190	50.654	180.993	4.277	0.542	763.032	2.7860
1021	11.5	8.0	1944 VII	9	276.047	284.802	116.231	15.791	16.752	783.776	2.7366
1022	13.1	9.5	1939 X	12	119.489	125.081	112.370	21.068	9.908	753.518	2.8093
1023	14.0	9.8	1941 VII	11	268.976	202.199	195.076	9.985	5.405	628.178	3.1716
1024	15.4	11.8	1945 III	6	157.036	306.243	59.347	16.011	12.949	728.845	2.8724
1025	13.7	12.2	1943 XII	22	294.188	347.568	163.100	26.871	2.227	1274.509	1.9790
1026	14.8	12.6	1923 VIII	17	11.189	211.381	104.500	5.378	10.404	1052.859	2.2478
1027	14.8	10.6	1936 I	21	332.548	124.100	30.013	1.291	6.707	629.905	3.1658
1028	13.4	8.8	1945 IV	23	134.699	5.500	65.143	9.476	6.386	564.156	3.4073
1029	13.7	10.0	1924 V	1	51.464	140.242	30.840	2.460	1.419	721.934	2.8907
1030	14.0	9.9	1945 II	8	319.441	0.451	188.795	14.746	7.070	643.482	3.1212
1031	13.0	9.1	1940 VI	15	96.666	303.257	219.635	17.600	3.815	667.650	3.0454
1032	12.8	8.7	1936 VIII	15	68.189	183.743	77.386	9.513	8.033	641.408	3.1278
1033	14.2	10.3	1933 III	7	183.340	217.621	189.861	10.660	7.045	682.593	3.0007
1034	14.7	12.3	1924 X	2	28.041	16.840	305.018	3.993	15.268	1021.951	2.2929
1035	14.2	10.1	1938 IV	5	181.096	323.027	2.843	17.988	10.975	633.412	3.1541
1036	12.5	9.2	1941 IV	16	289.754	130.649	216.668	26.166	32.643	815.440	2.6653
1037	15.1	13.0	1924 XI	15	22.442	177.026	199.566	5.409	10.243	1098.487	2.1851
S 1038	14.5	9.2	1945 V	15	255.174	309.023	58.708	9.247	14.056	457.803	3.9164
1039	13.5	10.2	1924 XII	2	237.180	320.974	222.512	4.525	3.617	808.394	2.6807
1040	14.2	10.1	1942 III	25	78.146	153.921	280.978	16.636	11.224	646.138	3.1126
1041	13.1	9.1	1940 I	17	65.755	335.419	60.826	13.887	7.849	659.362	3.0708
1042	13.3	9.0	1945 XII	19	81.753	296.069	52.696	20.869	7.305	616.867	3.2102
1043	13.5	9.4	1943 X	3	43.538	153.569	160.012	8.891	2.526	652.618	3.0919
1044	13.9	10.9	1900 I	0	347.390	225.690	60.950	4.288	8.164	857.986	2.5765
1045	15.8	13.3	1925 I	14	1.521	161.296	271.833	0.257	9.156	981.424	2.3556
1046	13.9	10.0	1943 VIII	3	244.162	44.904	11.526	7.942	3.591	687.947	2.9852
1047	14.2	12.0	1924 XI	18	21.291	298.560	78.428	5.661	11.060	1057.850	2.2407
1048	12.6	9.2	1945 VII	26	47.659	181.779	53.097	15.823	10.308	785.395	2.7328
1049	14.2	10.1	1937 V	12	30.077	37.575	343.731	15.131	7.312	650.376	3.0990
1050	15.1	12.0	1950 I	0	220.440	64.930	342.740	12.529	10.135	834.173	2.6252

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	<sup>m</sup>	<sup>m</sup>			<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	
1051	13.8	9.6	1936 VII	19	357.188	131.590	181.409	23.251	6.421	616.413	3.2119
1052	12.9	10.7	1926 I	1	31.562	295.890	99.665	4.693	8.249	1061.128	2.2361
1053	14.9	11.8	1925 XI	16	340.070	40.019	18.281	8.360	5.536	838.951	2.6152
1054	13.9	10.2	1925 XI	20	27.692	292.701	86.740	10.870	7.710	710.555	2.9215
1055	13.1	11.0	1925 XII	18	82.467	175.076	147.173	5.262	11.972	1088.438	2.1986
1056	13.4	11.2	1925 VII	16	347.806	211.011	104.110	5.427	10.191	1065.345	2.2302
1057	13.0	10.6	1925 I	1	286.728	108.429	261.280	3.496	14.305	721.055	2.8931
1058	14.3	12.2	1925 VII	6	337.546	92.117	222.405	3.689	10.792	1089.984	2.1964
1059	14.4	11.2	1941 II	26	240.896	86.162	200.680	10.145	10.621	826.019	2.6425
1060	14.8	12.6	1925 VIII	14	14.378	82.563	221.665	5.911	11.635	1059.810	2.2380
1061	14.7	10.5	1939 III	16	99.948	322.584	89.173	2.602	12.464	622.693	3.1902
1062	13.3	9.4	1939 VI	15	185.022	95.728	342.701	5.630	4.181	681.581	3.0037
1063	12.9	10.5	1931 VI	17	68.514	105.792	95.405	5.981	2.233	1007.779	2.3144
1064	13.7	10.7	1937 III	8	232.514	20.038	281.137	9.449	9.850	872.872	2.5470
1065	15.0	12.5	1926 IX	5	6.630	351.325	330.641	8.370	17.302	977.854	2.3613
1066	14.8	12.2	1926 IX	2	351.379	15.390	345.599	4.848	11.949	952.465	2.4031
1067	14.4	10.7	1945 VIII	13	293.269	111.777	290.615	10.517	11.220	729.964	2.8695
1068	12.9	9.2	1945 VII	15	61.469	260.294	319.993	5.514	5.214	715.102	2.9091
1069	13.2	9.1	1935 VII	15	146.937	26.404	143.476	13.570	6.302	641.848	3.1264
1070	14.7	10.4	1944 XI	6	69.812	171.716	166.155	17.197	6.285	616.749	3.2107
1071	13.4	9.9	1935 VII	16	233.730	26.037	53.135	5.396	6.384	757.354	2.7999
1072	14.0	9.8	1937 X	15	306.097	25.804	37.475	8.033	12.414	621.275	3.1951
1073	14.6	10.4	1940 IX	8	11.195	294.709	39.686	1.636	11.152	625.218	3.1816
1074	13.6	9.4	1932 V	26	170.601	16.050	38.727	0.867	10.653	636.068	3.1453
1075	14.0	10.1	1941 VII	25	319.523	249.684	101.467	11.553	6.140	677.875	3.0147
1076	14.1	11.3	1900 I	0	1.480	299.280	144.530	3.290	8.360	910.966	2.4755
1077	14.7	12.1	1926 X	7	15.494	11.795	346.614	5.414	11.475	958.765	2.3926
1078	13.9	11.6	1926 XII	8	310.332	42.120	93.969	7.382	7.995	1037.894	2.2693
1079	14.2	10.4	1928 I	1	111.940	100.121	331.113	1.203	2.725	728.423	2.8736
1080	14.5	11.8	1927 VIII	30	312.715	54.927	2.705	4.643	14.882	942.836	2.4194
1081	14.6	10.5	1940 I	16	74.072	1.527	31.232	4.281	8.694	652.176	3.0933
1082	13.9	9.8	1927 X	29	49.104	184.313	148.379	1.812	10.398	643.522	3.1211
1083	14.7	12.2	1928 I	29	17.973	31.897	80.929	5.147	10.143	998.304	2.3290
1084	13.3	10.0	1927 V	2	309.396	105.784	187.810	3.866	7.387	804.832	2.6886
1085	13.6	9.4	1942 IV	14	282.190	138.929	140.474	6.641	3.735	626.414	3.1776
1086	13.0	8.8	1944 VIII	18	243.054	160.132	314.172	8.344	1.971	628.817	3.1695
1087	13.4	9.5	1940 III	2	83.659	24.930	30.982	10.104	5.039	677.265	3.0165
1088	13.4	11.3	1941 VI	19	84.044	317.856	54.503	7.653	11.332	1086.719	2.2008
1089	13.4	11.3	1941 VI	19	35.687	353.079	71.378	3.736	7.331	1077.379	2.2135
1090	14.6	12.1	1941 VI	19	261.966	336.386	148.010	21.492	12.884	979.900	2.3581
1091	14.8	10.2	1940 I	23	13.907	5.839	80.185	1.172	6.357	561.798	3.4168
1092	13.6	9.9	1950 I	0	314.590	311.780	308.750	5.390	4.680	717.712	2.9047
1093	13.5	9.4	1945 I	25	162.336	248.985	56.715	25.225	15.320	639.202	3.1351
1094	13.6	10.6	1926 II	15	33.583	305.833	149.647	13.933	7.595	872.448	2.5479
1095	13.1	11.1	1928 II	24	180.801	211.319	116.004	8.057	5.537	1122.592	2.1537
1096	12.8	9.6	1928 VII	22	342.994	245.781	81.854	9.504	10.904	845.635	2.6015
1097	15.0	11.7	1943 II	5	141.611	174.610	133.587	1.509	17.163	825.274	2.6441
1098	13.8	10.5	1941 VI	19	271.868	80.264	329.409	13.388	6.751	805.408	2.6874
1099	15.0	10.8	1945 XI	1	20.854	339.455	23.679	11.846	17.108	633.644	3.1534
1100	14.2	10.5	1950 I	0	154.910	17.930	306.220	1.048	3.842	718.937	2.8988



No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
1101	14.6	10.3	1933 XI	17	348.981	126.063	202.883	17.564	9.078	602.232	3.2621
1102	13.0	9.0	1935 I	10	127.970	115.942	217.497	15.806	6.989	662.076	3.0624
1103	13.3	11.9	1936 X	20	39.817	76.965	267.572	17.886	5.420	1319.559	1.9337
1104	15.4	12.2	1936 VIII	16	303.702	274.511	129.772	6.403	20.363	833.373	2.6269
1105	13.6	9.8	1929 I	12	92.039	222.234	117.760	10.959	5.848	679.074	3.0111
1106	14.2	11.2	1929 III	15	339.585	226.492	328.887	13.161	7.087	847.462	2.5977
1107	12.7	8.5	1940 II	13	36.150	359.348	111.301	7.055	6.194	621.539	3.1942
1108	14.5	11.8	1929 VII	11	334.850	77.842	234.533	25.037	14.608	938.001	2.4277
1109	13.7	9.5	1946 I	20	265.415	350.912	269.615	4.182	7.876	621.193	3.1954
1110	13.7	11.5	1928 IX	12	12.732	76.662	242.328	5.853	13.934	1073.917	2.2183
1111	13.3	9.5	1938 IV	21	216.067	233.573	132.916	3.869	5.795	685.644	2.9919
1112	13.5	9.5	1941 II	4	84.308	81.018	303.896	8.977	6.195	676.869	3.0176
1113	13.3	9.2	1941 XI	23	54.875	115.686	325.560	13.241	8.285	647.017	3.1098
1114	12.7	8.5	1941 III	8	119.899	198.530	196.368	10.731	4.394	652.766	3.0915
1115	13.5	9.4	1928 XII	14	340.068	49.643	73.146	15.445	9.202	647.370	3.1086
1116	13.0	9.2	1938 I	1	12.917	81.264	357.449	16.578	13.172	709.646	2.9240
1117	13.6	11.4	1927 XII	1	18.971	149.150	147.382	4.327	11.285	1053.169	2.2474
1118	13.9	9.6	1930 XII	13	243.452	358.586	319.728	14.010	3.747	618.133	3.2059
1119	13.6	10.5	1927 X	27	91.372	228.234	57.773	7.881	8.670	839.989	2.6131
1120	13.6	11.4	1928 X	14	356.885	218.369	158.683	4.044	8.903	1075.380	2.2163
1121	14.0	11.1	1950 I	0	51.938	48.653	358.592	6.179	9.147	873.125	2.5466
1122	14.5	11.4	1928 IX	14	339.324	327.267	63.597	4.745	15.193	844.324	2.6043
1123	13.7	11.5	1928 X	4	344.779	316.094	79.939	6.425	9.009	1068.906	2.2253
1124	14.3	9.6	1931 IV	12	266.658	255.581	23.509	7.640	1.766	708.873	2.9262
1125	16.5	12.2	1930 I	27	73.434	320.309	87.140	2.773	12.422	609.427	3.2364
1126	14.3	12.0	1929 I	12	335.857	134.171	1.296	6.468	8.482	1035.650	2.2726
1127	13.1	10.0	1929 II	21	58.427	280.037	129.473	14.732	15.528	848.657	2.5952
1128	13.1	9.6	1929 III	13	246.418	233.003	59.361	1.031	2.543	762.265	2.7878
1129	13.4	9.5	1942 II	14	75.249	132.965	270.397	8.621	5.098	676.055	3.0201
1130	14.1	11.9	1929 IX	29	21.494	111.625	216.700	2.152	11.354	1066.222	2.2290
1131	15.6	13.4	1929 X	19	17.082	247.241	100.796	3.235	16.494	1066.548	2.2285
1132	13.0	9.7	1925 I	1	3.735	266.281	31.592	7.254	15.901	805.743	2.6866
1133	13.3	11.2	1929 X	6	356.814	305.470	58.307	5.382	10.787	1097.685	2.1862
1134	17.3	14.0	1942 VI	10	330.292	329.462	6.980	14.974	28.021	809.080	2.6792
1135	13.6	10.4	1929 X	7	19.404	1.381	351.574	4.583	6.565	814.951	2.6664
1136	13.8	10.8	1929 XI	1	37.021	146.039	210.262	8.879	14.642	863.272	2.5659
1137	13.0	10.3	1929 X	8	27.556	275.952	78.604	4.320	5.555	940.492	2.4234
1138	14.4	10.2	1942 I	1	94.447	98.557	284.469	14.001	4.693	637.204	3.1416
1139	14.1	12.7	1941 VI	19	96.784	205.517	213.215	13.102	14.782	1305.814	1.9472
1140	13.2	9.7	1941 V	6	232.943	308.484	72.499	14.097	6.328	768.145	2.7736
1141	14.8	12.5	1930 II	16	74.939	274.588	105.633	4.274	9.466	1036.981	2.2707
1142	15.2	11.0	1944 IX	25	119.993	106.009	139.406	2.088	5.709	627.190	3.1750
1143	14.0	7.4	1941 I	15	18.219	233.295	220.673	3.150	5.356	301.406	5.1748
1144	13.6	8.5	1945 III	25	154.479	213.724	159.601	9.795	4.722	483.382	3.7770
1145	13.4	10.7	1929 II	1	260.560	265.545	347.493	6.248	6.833	940.660	2.4232
1146	13.4	9.4	1935 VII	17	38.375	59.982	215.684	17.219	14.177	665.242	3.0527
1147	14.4	12.1	1950 I	0	353.880	14.070	265.480	3.860	13.409	1036.348	2.2716
1148	13.7	9.8	1941 XI	26	106.616	176.534	146.091	10.781	6.379	675.407	3.0220
1149	13.5	9.8	1937 III	11	150.676	112.309	262.396	11.734	5.639	719.420	2.8974
1150	15.1	13.0	1929 IX	8	3.129	137.681	206.898	2.372	11.828	1094.078	2.1910



No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	<sup>m</sup>	<sup>m</sup>			<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	<sup>o</sup>	
1151	15.5	12.9	1929 IX	9	7.396	120.791	226.108	6.519	16.009	951.900	2.4040
1152	13.4	10.7	1945 I	13	281.434	215.867	332.275	5.093	2.410	938.605	2.4268
1153	13.8	11.7	1924 IX	6	31.203	26.653	280.956	3.337	9.230	1090.513	2.1958
S 1154	14.2	9.6	1944 XII	31	163.375	202.045	84.132	4.550	2.473	566.099	3.3995
1155	14.2	11.4	1900 I	0	190.450	191.250	39.700	6.670	9.640	918.410	2.4621
1156	14.3	12.0	1933 IX	28	237.575	47.620	90.250	1.425	2.468	1044.141	2.2603
1157	13.8	9.6	1935 I	19	43.757	301.666	338.812	9.459	6.415	617.145	3.2093
1158	13.7	10.7	1950 I	0	292.120	54.530	344.460	14.941	6.426	864.764	2.5629
1159	14.5	11.9	1929 IX	29	53.368	311.835	348.146	13.047	3.244	966.871	2.3792
1160	14.4	11.4	1929 IX	9	356.237	3.375	4.027	14.932	6.643	866.049	2.5604
1161	15.0	10.8	1929 X	19	352.570	310.316	73.572	9.409	5.658	629.574	3.1669
S 1162	13.7	8.4	1944 XII	31	190.466	228.597	40.774	1.931	6.243	449.666	3.9635
1163	13.6	9.4	1943 V	19	251.952	217.701	128.247	8.991	4.258	617.275	3.2089
1164	14.4	12.0	1930 IV	17	36.405	339.458	156.935	25.135	11.344	1012.960	2.3064
1165	13.8	9.7	1945 I	25	192.184	92.468	205.651	12.763	12.053	640.587	3.1305
1166	14.1	11.1	1930 VII	6	344.118	187.543	107.390	18.833	11.824	877.267	2.5385
1167	13.8	9.2	1944 XI	6	126.698	57.276	226.668	5.703	3.035	561.341	3.4186
1168	14.5	11.5	1938 VIII	18	342.016	121.863	218.837	12.669	12.907	870.650	2.5514
1169	15.0	12.6	1930 X	1	293.220	175.382	255.414	4.044	8.971	1004.692	2.3191
1170	13.9	11.5	1942 II	6	39.974	58.169	0.996	22.262	17.400	1000.643	2.3253
1171	13.3	9.1	1944 III	11	118.757	287.195	122.832	3.049	12.361	633.191	3.1549
S 1172	14.4	7.7	1942 XI	1	96.064	45.499	246.817	16.690	5.801	299.352	5.1986
S 1173	14.6	8.0	1940 VIII	25	14.656	30.292	284.179	6.976	7.914	308.737	5.0926
1174	14.9	11.0	1938 III	14	179.737	352.152	1.846	10.115	6.458	675.172	3.0227
1175	14.3	10.0	1934 VI	12	300.047	80.682	238.210	16.364	1.659	614.223	3.2195
1176	13.9	10.6	1945 III	5	77.982	154.056	272.835	6.630	8.161	802.403	2.6941
1177	13.4	8.9	1935 VIII	19	62.470	33.341	253.169	14.990	0.363	577.146	3.3560
1178	16.6	13.3	1940 II	5	8.046	353.502	170.481	6.907	10.590	808.949	2.6795
1179	16.1	13.0	1936 II	5	9.458	232.381	7.553	8.732	10.205	837.849	2.6175
S 1180	14.2	8.9	1945 I	25	180.202	217.939	88.618	7.206	10.309	449.338	3.9654
1181	14.1	10.9	1934 X	4	330.174	153.699	261.444	5.569	11.319	816.238	2.6636
1182	13.3	11.0	1927 IV	4	105.403	62.028	336.609	9.409	6.697	1044.833	2.2593
1183	14.3	11.7	1939 X	3	179.960	204.497	15.372	2.817	7.489	964.177	2.3836
1184	13.6	10.4	1926 IX	30	51.965	308.209	356.302	11.336	4.184	814.242	2.6679
1185	13.7	11.5	1941 VI	19	5.516	0.027	71.837	5.716	6.029	1059.948	2.2377
1186	14.5	10.6	1945 VIII	21	349.901	295.797	43.608	10.781	6.496	676.302	3.0193
1187	14.8	11.6	1935 VII	17	132.680	72.457	328.091	10.734	12.853	826.896	2.6395
1188	13.2	11.1	1945 III	22	170.723	5.823	5.581	4.838	10.419	1093.728	2.1915
1189	13.2	9.4	1941 I	9	5.443	95.719	276.100	9.853	6.569	706.759	2.9320
1190	14.2	11.5	1930 X	17	316.079	39.725	26.778	3.190	7.553	936.022	2.4312
1191	13.7	10.0	1931 II	12	332.217	43.058	135.236	18.535	2.283	720.733	2.8939
1192	13.7	11.1	1931 V	2	38.178	130.076	1.529	23.838	15.176	975.055	2.3658
1193	14.3	11.1	1931 V	16	355.433	182.873	49.970	14.168	7.032	824.439	2.6459
1194	13.3	9.6	1931 VI	14	56.573	242.839	292.119	10.883	5.085	712.976	2.9149
1195	14.9	12.6	1931 VI	15	1.309	326.602	281.589	7.172	11.558	1046.842	2.2564
1196	13.1	9.9	1931 VI	12	260.779	260.614	101.301	17.697	10.362	821.300	2.6526
1197	12.8	9.1	1925 I	1	306.550	273.082	257.108	12.872	13.617	725.073	2.8823
1198	16.8	14.6	1931 X	12	13.048	81.382	261.077	2.724	19.593	1051.911	2.2492
1199	13.4	9.5	1945 III	30	44.449	279.112	236.604	8.758	2.037	676.636	3.0183
1200	14.0	10.0	1931 X	29	108.170	44.343	206.330	4.588	6.576	663.812	3.0571

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
1201	14.2	10.9	1931 X	29	7.455	163.038	203.600	6.998	2.187	800.223	2.6990
S 1202	14.9	9.6	1942 II	17	121.681	315.269	51.404	3.418	11.807	456.306	3.9249
1203	14.6	10.9	1939 V	5	185.316	172.499	225.585	5.877	15.000	724.113	2.8849
1204	14.8	12.5	1931 X	12	31.175	311.831	7.928	1.886	17.022	1041.700	2.2638
1205	16.1	13.2	1900 I	0	47.630	345.660	23.550	8.930	16.020	878.674	2.5358
1206	14.6	10.9	1931 X	29	147.132	277.475	325.189	13.040	3.177	729.711	2.8705
1207	14.9	11.0	1945 VI	26	219.123	41.797	20.892	10.395	5.412	677.423	3.0159
S 1208	14.8	8.1	1940 VIII	14	347.434	292.930	48.003	33.707	5.329	302.587	5.1613
1209	14.3	10.1	1933 V	18	343.098	171.425	90.940	6.868	6.059	624.875	3.1827
1210	13.5	9.6	1931 VI	21	348.503	164.298	107.471	11.253	3.474	679.278	3.0106
1211	14.6	10.8	1938 IV	28	173.529	209.896	130.347	12.752	8.882	706.442	2.9329
S 1212	14.8	9.4	1941 II	23	17.815	353.539	149.570	7.583	10.319	449.247	3.9660
1213	14.6	10.5	1932 I	28	47.985	104.385	273.005	13.068	7.383	638.793	3.1364
1214	12.9	9.6	1932 I	1	139.071	30.255	286.706	9.853	6.691	794.680	2.7115
1215	13.1	10.0	1938 VIII	10	293.737	263.928	124.066	15.901	7.645	856.312	2.5798
1216	14.1	11.9	1932 II	26	265.465	143.139	121.712	7.593	10.277	1063.488	2.2328
1217	15.1	12.6	1950 I	0	287.160	90.210	148.410	5.120	8.880	983.026	2.3531
1218	15.1	12.8	1932 I	1	358.637	67.689	63.832	3.169	6.299	1041.498	2.2641
1219	14.0	11.8	1932 II	26	80.939	22.540	42.584	4.426	7.168	1077.730	2.2131
1220	14.9	11.0	1943 IV	27	107.869	332.755	113.747	11.291	3.784	682.159	3.0020
1221	18.0	17.0	1940 III	27	356.143	25.354	171.340	11.941	25.908	1330.274	1.9233
1222	14.8	11.3	1938 XI	12	114.886	57.120	246.757	19.722	14.534	761.636	2.7894
1223	14.1	10.4	1925 I	1	176.317	10.921	41.290	2.576	3.455	729.943	2.8695
1224	13.5	11.1	1927 IX	1	336.373	127.570	258.516	7.860	11.522	1014.240	2.3045
1225	13.9	11.7	1930 IV	17	86.342	98.799	12.574	3.089	4.226	1062.759	2.2338
1226	14.3	11.2	1935 IX	18	149.866	140.833	17.851	9.790	6.197	855.672	2.5811
1227	14.3	10.1	1936 VI	20	349.868	291.332	3.010	16.315	12.892	623.173	3.1886
1228	14.4	10.9	1939 VI	3	93.415	206.704	309.080	3.292	1.975	771.628	2.7652
1229	15.1	10.9	1937 I	0	339.586	159.749	202.302	0.843	9.605	622.649	3.1904
1230	15.7	12.6	1925 I	0	124.760	184.610	201.050	10.500	10.077	859.106	2.5742
1231	14.1	10.9	1931 X	29	149.267	243.597	342.639	11.510	4.945	814.116	2.6682
1232	13.8	9.6	1931 X	29	138.522	327.586	263.541	10.192	8.612	629.891	3.1659
1233	13.6	10.6	1931 X	29	115.163	329.194	291.939	5.579	3.243	868.695	2.5552
1234	14.3	10.4	1940 VI	20	234.049	85.608	305.679	8.512	5.322	678.625	3.0124
1235	15.2	14.0	1931 XII	8	359.655	43.005	12.767	25.020	8.843	1343.831	1.9103
1236	13.7	11.0	1931 XII	1	40.746	303.835	49.090	13.157	14.048	936.000	2.4312
1237	13.3	10.2	1932 I	27	72.066	304.438	58.264	9.727	4.398	840.170	2.6127
1238	14.2	11.0	1932 III	13	359.949	91.303	52.488	12.152	8.346	813.622	2.6692
1239	14.6	11.4	1950 I	0	64.940	32.820	73.130	1.680	13.530	816.855	2.6622
1240	13.7	10.0	1934 II	27	293.408	21.762	324.588	10.212	9.968	730.609	2.8677
1241	12.9	8.7	1932 IV	27	278.217	329.841	322.801	23.552	5.203	621.607	3.1939
1242	12.3	9.0	1941 VI	15	197.297	51.063	350.552	10.213	10.853	783.323	2.7378
1243	14.9	10.8	1943 XII	22	340.032	57.158	246.496	13.231	2.526	650.913	3.0974
1244	13.3	10.8	1932 VI	16	64.833	259.289	277.423	8.696	5.676	989.150	2.3433
1245	13.1	9.4	1925 I	1	81.614	204.918	152.253	2.869	4.577	721.035	2.8931
1246	14.7	11.6	1932 VII	31	333.576	52.675	291.314	16.118	17.778	835.916	2.6216
1247	14.2	10.1	1932 X	1	39.174	134.605	163.128	1.723	9.845	640.746	3.1300
1248	13.0	9.6	1932 IX	10	296.936	337.199	79.767	9.157	0.848	789.795	2.7227
1249	13.3	11.1	1932 XII	2	313.869	222.240	259.286	4.866	4.442	1069.451	2.2245
1250	15.3	12.3	1933 II	20	347.079	217.262	292.474	15.181	16.042	872.546	2.5477

No.	m	g	Epoch	0 <sup>h</sup> UT	M	ω	Ω	i	ϕ	n	a	
	m	m			°	°	°	°	°	"		
1251	13.9	10.5	1938	IV	3	155.501	215.882	141.051	6.033	8.936	791.690	2.7183
1252	13.5	10.2	1944	IX	27	189.208	63.356	140.967	33.920	11.770	801.997	2.6950
1253	15.6	11.4	1943	XII	30	48.130	353.748	40.366	1.343	11.164	630.130	3.1651
1254	13.8	9.7	1935	XII	8	286.353	233.889	289.519	7.085	1.700	638.797	3.1364
1255	14.4	10.2	1939	XII	23	72.876	125.673	239.231	8.437	10.068	635.295	3.1479
S 1256	14.4	9.1	1945	IV	15	194.039	134.005	240.414	4.088	3.342	458.918	3.9100
1257	14.1	11.2	1900	I	0	333.960	13.250	214.100	3.920	5.050	905.218	2.4859
1258	14.3	10.1	1932	IX	13	355.556	47.785	300.996	7.728	3.079	624.296	3.1848
1259	14.1	10.0	1934	V	4	6.599	146.429	75.480	2.400	7.726	650.546	3.0985
S 1260	14.1	11.0	1933	II	20	178.515	10.229	305.342	7.941	1.676	838.400	2.6164
1261	14.1	10.0	1939	VI	15	65.114	95.809	68.832	2.446	10.327	638.548	3.1372
1262	13.4	9.5	1940	VIII	23	22.151	181.247	124.942	13.107	0.129	682.753	3.0003
1263	11.8	8.6	1939	VII	21	234.104	286.470	158.701	29.214	10.949	815.699	2.6647
1264	12.9	9.3	1950	I	0	126.810	28.160	235.220	24.950	8.749	732.883	2.8619
1265	13.3	9.4	1935	V	28	172.515	85.032	315.539	9.652	2.006	677.954	3.0144
S 1266	13.2	8.7	1942	VII	20	6.243	329.564	322.255	17.237	1.120	573.134	3.3716
1267	14.2	11.4	1900	I	0	3.240	265.380	25.430	4.770	10.550	915.536	2.4673
S 1268	13.2	7.9	1945	IV	30	56.991	139.872	353.266	4.426	6.133	453.961	3.9384
S 1269	13.4	8.0	1944	VII	19	100.450	34.980	135.692	2.738	4.141	452.769	3.9454
1270	15.0	12.8	1930	III	21	0.138	257.577	97.957	5.982	11.888	1062.230	2.2346
1271	14.2	10.1	1935	IX	1	242.648	268.269	127.841	6.654	6.958	637.591	3.1403
1272	15.1	11.6	1931	X	29	43.857	0.654	322.343	8.446	8.919	764.733	2.7818
S 1273	15.1	12.5	1932	IX	13	0.868	46.505	297.164	5.427	9.390	957.802	2.3942
1274	13.5	11.3	1932	X	20	214.741	242.980	327.429	4.410	6.488	1066.204	2.2290
1275	13.7	10.4	1925	I	1	102.695	194.639	189.129	12.872	9.677	808.571	2.6804
1276	14.0	9.8	1936	VII	10	237.543	340.334	114.844	23.395	5.879	628.716	3.1698
1277	14.3	11.0	1943	X	31	79.384	44.486	247.919	6.999	13.795	800.655	2.6980
1278	14.2	11.5	1933	VII	27	331.493	237.139	90.579	10.895	15.092	950.850	2.4058
1279	14.7	12.1	1933	VII	27	7.433	295.348	336.137	5.723	12.076	972.420	2.3701
S 1280	13.9	9.3	1945	VII	5	293.076	65.877	295.134	6.473	2.888	562.774	3.4128
1281	13.6	10.6	1933	IX	12	48.782	72.360	210.564	7.413	12.011	867.209	2.5581
1282	15.6	11.5	1939	X	8	336.294	76.834	325.148	18.044	7.181	643.370	3.1215
1283	14.4	10.1	1942	VIII	19	311.764	236.294	158.517	8.820	11.206	612.263	3.2264
1284	13.5	10.3	1944	I	31	86.945	113.593	303.397	10.888	9.875	824.574	2.6456
1285	13.0	9.1	1935	VII	17	91.193	68.519	319.117	5.714	3.063	686.158	2.9904
1286	13.7	9.8	1935	VII	17	164.752	104.370	201.602	9.705	5.394	675.718	3.0211
1287	13.8	9.9	1933	X	15	259.189	264.023	203.617	9.786	3.505	678.471	3.0129
1288	14.8	11.1	1933	VIII	26	351.833	51.534	299.911	7.581	3.730	724.095	2.8850
1289	13.5	9.9	1933	VIII	19	23.264	114.735	194.053	1.584	3.541	733.238	2.8609
1290	14.1	11.5	1933	IX	8	331.738	76.701	307.939	5.598	8.858	974.917	2.3661
1291	13.4	9.5	1946	I	20	146.724	111.995	216.377	9.088	5.514	679.380	3.0102
1292	13.3	10.3	1933	IX	8	216.276	234.742	272.259	2.162	2.945	874.679	2.5435
1293	15.0	12.8	1933	XI	1	29.102	96.528	236.770	5.410	15.707	1067.472	2.2272
1294	14.0	10.7	1940	V	11	179.837	310.429	81.638	8.702	13.492	805.281	2.6877
1295	14.8	10.3	1934	I	8	344.835	271.834	189.078	2.760	8.737	575.606	3.3619
1296	14.0	11.3	1934	I	8	346.853	234.785	227.421	4.098	8.158	943.833	2.4177
1297	14.4	10.5	1935	IV	29	142.863	124.370	297.079	8.957	3.795	674.570	3.0245
1298	13.8	9.7	1945	I	24	109.741	54.386	301.581	5.543	8.284	640.853	3.1296
1299	14.8	11.3	1934	IV	16	54.959	257.027	166.621	7.888	10.643	755.749	2.8038
1300	14.2	10.7	1934	IV	16	94.272	335.749	83.415	9.554	0.375	765.161	2.7808

No.	m	g	Epoch	$\Delta$ UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
1301	13.7	10.2	1941 IX	3	267.032	301.612	161.706	33.928	16.029	772.085	2.7641
1302	14.3	10.2	1941 XI	26	348.065	350.690	90.607	2.609	10.159	645.466	3.1146
1303	13.1	8.9	1942 X	12	185.833	107.695	73.322	19.580	7.588	618.307	3.2052
1304	13.1	8.9	1942 XII	31	227.475	126.730	88.303	18.800	7.363	621.598	3.1940
1305	13.6	9.7	1944 VIII	24	100.378	150.534	63.177	2.335	3.942	677.592	3.0155
1306	13.4	9.3	1930 VIII	1	272.167	136.112	275.254	14.911	5.583	636.054	3.1454
1307	13.5	11.3	1930 X	19	313.191	206.066	234.134	3.933	5.601	1050.702	2.2509
1308	14.1	10.4	1944 V	21	40.865	19.402	354.662	5.473	0.303	715.574	2.9078
1309	13.9	9.6	1945 I	25	57.853	241.392	206.270	10.169	9.179	613.309	3.2227
1310	13.6	11.0	1932 IV	6	48.708	87.058	358.224	21.083	20.789	958.153	2.3936
1311	14.8	12.1	1925 I	1	333.045	252.642	245.775	2.813	2.517	938.095	2.4276
1312	15.9	11.8	1942 IV	5	156.989	260.094	130.147	21.901	12.621	653.127	3.0903
1313	14.4	11.2	1933 X	8	331.352	97.358	299.097	12.547	11.992	819.832	2.6558
1314	14.7	12.4	1933 X	15	330.523	141.944	275.509	5.223	10.038	1020.874	2.2945
1315	13.5	9.2	1933 X	18	65.566	48.518	237.649	7.034	3.350	614.340	3.2191
1316	15.5	12.8	1933 XI	27	15.512	146.941	238.360	23.838	18.722	947.814	2.4110
1317	12.2	9.2	1935 IX	18	329.682	32.689	7.345	20.676	14.665	627.177	3.1750
1318	13.8	11.4	1934 V	3	13.763	194.722	358.308	24.675	11.642	1011.529	2.3086
1319	13.8	9.9	1941 X	13	156.360	310.229	258.907	2.733	12.024	689.024	2.9821
1320	14.2	10.3	1934 VI	2	345.096	201.822	72.724	20.041	13.307	686.624	2.9890
1321	13.5	9.7	1935 X	20	54.406	341.917	318.929	9.485	9.373	701.904	2.9454
1322	15.1	12.4	1934 VI	15	352.981	27.736	253.296	23.407	13.440	941.022	2.4225
1323	13.9	9.7	1940 VI	28	77.858	128.790	46.336	18.781	10.957	623.717	3.1867
1324	13.9	11.8	1934 VI	12	352.906	327.815	304.549	4.522	9.392	1097.125	2.1869
1325	14.4	11.4	1934 VII	22	332.793	334.421	14.366	7.446	15.205	877.741	2.5376
1326	15.1	11.9	1934 VII	22	310.725	276.769	102.380	16.008	12.955	815.214	2.6658
1327	14.0	10.5	1941 I	20	138.670	267.016	58.399	5.845	9.331	765.810	2.7792
1328	14.0	9.3	1938 X	28	356.899	170.810	225.299	5.667	7.884	542.617	3.4968
1329	12.9	9.8	1933 III	29	260.260	163.875	132.424	14.465	9.889	837.631	2.6180
1330	14.0	9.8	1942 II	26	7.598	242.304	159.405	15.790	3.758	628.636	3.1701
1331	14.6	10.5	1941 I	10	147.084	183.775	121.409	3.040	10.831	650.653	3.0981
1332	13.3	9.3	1939 II	17	101.007	340.956	14.827	2.488	7.298	661.270	3.0649
1333	14.7	11.5	1934 IV	9	66.884	333.613	115.367	14.586	7.579	829.689	2.6347
1334	14.2	10.5	1945 XI	1	129.407	129.627	133.661	11.426	5.344	712.987	2.9149
1335	15.2	13.0	1934 X	13	0.219	195.773	172.596	2.543	9.392	1056.902	2.2421
1336	13.9	10.3	1943 VI	17	330.286	216.710	97.570	3.196	3.655	737.428	2.8501
1337	14.3	10.6	1934 X	1	7.863	199.205	160.800	17.996	5.797	714.870	2.9097
1338	14.8	12.5	1934 XII	27	6.320	108.324	325.905	4.820	6.465	1041.488	2.2641
1339	13.7	9.8	1934 XII	26	357.888	155.751	292.041	8.710	3.144	675.714	3.0211
1340	14.6	10.4	1935 I	1	252.274	231.715	347.254	0.434	7.432	625.124	3.1819
1341	13.7	10.3	1944 I	31	227.960	138.117	107.985	13.079	4.430	781.079	2.7429
1342	14.0	11.7	1935 III	1	345.623	228.321	313.128	20.975	11.649	1024.844	2.2886
1343	14.2	11.2	1935 IV	30	290.513	232.815	41.724	6.055	6.637	862.519	2.5674
1344	14.5	12.3	1935 V	5	18.079	131.449	60.130	5.657	6.918	1052.869	2.2478
S 1345	14.1	8.8	1942 V	23	137.847	338.938	137.478	11.363	10.194	447.934	3.9737
1346	13.8	10.6	1942 II	14	105.967	246.549	166.571	14.017	10.227	832.090	2.6296
1347	13.4	10.4	1925 I	1	94.599	210.651	229.724	11.798	4.535	860.490	2.5714
1348	13.5	10.0	1939 VII	10	182.006	16.079	89.713	6.619	7.931	761.294	2.7902
1349	13.8	9.9	1934 VII	22	24.637	300.719	308.721	10.005	8.829	677.703	3.0152
1350	14.9	11.3	1934 X	30	13.716	236.578	140.132	2.941	5.113	734.184	2.8585

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$	i	$\phi$	n	a
						1950.0					
	m	m			°	°	°	°	°	"	
1351	13.6	9.4	1934 X	1	320.790	47.437	11.053	9.692	5.347	624.032	3.1857
1352	13.9	10.4	1945 IV	15	165.645	212.601	186.484	3.737	3.735	766.032	2.7787
1353	13.5	9.6	1940 III	10	203.964	92.872	212.739	9.175	5.349	679.052	3.0112
1354	14.0	9.9	1939 I	4	197.983	243.390	31.208	6.010	12.415	641.909	3.1262
1355	13.1	12.1	1935 VI	7	33.740	339.174	225.015	22.820	2.581	1406.170	1.8534
1356	12.8	8.8	1935 VI	7	248.545	292.869	70.552	8.046	2.619	654.312	3.0866
1357	13.2	9.0	1935 VII	17	299.662	287.642	84.471	14.039	7.789	619.896	3.1998
1358	14.0	11.2	1935 VIII	26	3.538	287.090	21.586	2.183	9.877	911.082	2.4753
1359	13.2	9.1	1935 VIII	26	277.329	339.172	64.955	11.123	3.836	644.156	3.1190
1360	13.8	10.6	1935 VIII	26	38.327	285.775	332.020	22.810	12.573	829.182	2.6358
1361	14.2	10.1	1935 IX	22	9.159	170.292	165.444	21.492	6.979	654.098	3.0873
S 1362	14.4	10.0	1935 VIII	26	330.334	263.086	121.558	24.106	19.838	596.117	3.2844
1363	14.2	10.5	1935 IX	22	17.872	109.532	215.934	1.081	3.660	717.299	2.9032
1364	14.3	10.4	1942 I	14	196.147	223.572	64.647	11.486	4.046	679.121	3.0110
1365	13.5	11.3	1928 IX	23	104.592	335.568	258.994	5.060	7.065	1052.050	2.2489
1366	13.1	9.4	1937 XI	25	113.887	280.846	25.003	9.475	7.996	728.019	2.8746
1367	14.8	12.3	1934 VII	25	17.051	346.641	270.858	22.468	7.555	988.548	2.3443
1368	12.9	10.0	1935 VI	7	328.256	255.154	18.606	14.896	3.663	886.259	2.5213
1369	13.8	9.7	1945 V	3	297.368	124.978	181.584	14.290	12.199	644.170	3.1189
1370	15.2	13.0	1935 IX	9	29.770	1.859	306.246	4.818	9.841	1049.769	2.2522
1371	14.9	10.6	1935 X	8	76.149	82.319	187.314	16.420	5.616	617.468	3.2082
1372	14.7	11.2	1935 X	8	319.820	86.258	328.129	16.492	8.440	770.394	2.7682
1373	16.7	12.1	1936 III	13	18.654	99.052	298.112	38.881	18.678	561.596	3.4176
1374	15.1	12.9	1935 XI	24	24.623	59.569	302.980	5.318	16.071	1051.020	2.2504
1375	13.7	10.9	1935 XI	17	334.016	28.323	53.032	5.861	4.020	926.360	2.4480
1376	14.5	12.3	1935 XII	4	68.132	154.695	163.446	3.527	12.421	1067.013	2.2279
1377	14.7	12.4	1941 XI	2	184.290	354.713	223.321	6.014	5.327	1044.101	2.2604
1378	13.9	11.3	1936 III	16	307.523	200.027	43.642	3.620	8.551	969.652	2.3746
1379	13.7	10.8	1936 IV	25	354.693	33.379	169.870	15.470	4.721	882.346	2.5288
S 1380	15.3	11.2	1936 IV	18	312.808	242.713	0.635	10.489	6.344	636.410	3.1442
1381	14.3	11.5	1930 IX	1	329.490	29.247	352.216	4.666	10.271	904.194	2.4879
1382	14.1	11.9	1925 I	22	259.441	244.954	353.572	1.577	7.528	1072.818	2.2198
1383	15.0	11.0	1942 I	31	120.611	156.133	212.967	0.009	10.679	658.001	3.0751
1384	14.3	11.0	1934 X	1	314.696	273.912	153.512	11.828	10.578	810.281	2.6766
1385	13.4	10.0	1936 IX	20	350.220	258.976	115.177	6.943	6.150	781.499	2.7419
1386	15.3	12.8	1935 VIII	1	0.052	150.937	161.764	11.732	16.631	977.201	2.3624
1387	15.0	12.7	1935 IX	3	13.777	124.004	203.278	5.544	12.033	1041.048	2.2648
1388	14.0	10.1	1938 IV	21	233.246	257.842	55.286	11.201	5.196	675.526	3.0216
1389	14.0	10.4	1935 X	1	244.503	318.257	175.473	2.052	1.027	731.517	2.8654
1390	13.1	8.5	1935 XI	16	18.452	330.946	30.154	19.996	2.123	556.741	3.4374
1391	15.8	12.8	1936 III	17	336.792	80.054	104.322	7.612	9.309	869.814	2.5530
1392	16.0	12.9	1938 X	16	343.413	41.878	358.642	12.331	11.492	841.983	2.6090
S 1393	14.0	11.3	1936 VI	20	18.334	174.360	56.914	5.913	6.230	934.122	2.4344
1394	13.8	11.1	1936 VII	11	346.480	112.695	178.839	2.659	4.338	931.028	2.4398
1395	15.0	10.8	1936 VIII	23	354.761	69.773	246.618	8.650	3.043	619.578	3.2009
1396	13.6	11.4	1936 VIII	20	39.497	264.705	359.815	4.510	9.429	1052.559	2.2482
1397	14.2	10.9	1945 III	20	3.180	205.023	77.535	3.526	14.497	807.179	2.6834
1398	15.4	11.2	1945 III	6	163.005	77.379	297.637	11.831	5.495	629.300	3.1679
1399	15.4	13.2	1936 VIII	23	321.110	223.093	161.651	6.481	9.670	1074.628	2.2173
1400	15.1	11.0	1936 XII	12	79.294	107.071	212.111	15.477	13.508	642.799	3.1233



No.	m	g	Epoch	$0^hUT$	M	$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
						1950.0					
1401	13.1	10.8	1935 X	23	37.217	60.999	278.252	7.347	12.088	1034.244	2.2747
1402	15.8	12.5	1936 VII	14	18.985	9.056	267.380	14.291	8.888	807.768	2.6821
1403	15.0	11.6	1940 VIII	30	317.692	187.528	157.265	10.240	16.542	797.675	2.7047
S 1404	15.0	8.4	1940 I	5	59.372	57.505	332.308	18.156	6.503	304.196	5.1431
1405	16.2	14.0	1936 X	12	334.412	94.558	312.298	7.037	8.385	1050.792	2.2507
1406	15.7	12.4	1936 X	12	325.613	84.035	333.714	12.429	5.575	801.688	2.6957
1407	15.0	11.6	1937 I	14	35.165	107.634	270.257	5.780	16.353	771.806	2.7648
1408	14.4	10.3	1945 VI	15	244.065	184.664	202.366	8.318	5.448	647.718	3.1075
1409	13.5	10.2	1937 III	1	113.190	205.792	177.957	6.690	3.272	810.414	2.6763
1410	14.4	10.5	1937 III	11	90.845	229.761	171.845	10.350	6.256	676.457	3.0188
1411	14.0	10.1	1937 II	7	116.125	91.617	285.748	8.035	3.324	682.267	3.0017
1412	13.9	11.8	1937 I	20	41.085	12.647	66.084	4.727	6.520	1076.540	2.2147
1413	14.3	10.4	1937 II	13	26.093	293.483	179.733	10.197	3.807	675.606	3.0214
1414	15.3	11.8	1937 II	13	3.884	357.872	144.274	8.854	9.348	763.745	2.7842
1415	13.9	11.7	1937 III	5	316.148	238.949	329.492	3.434	4.967	1069.457	2.2245
1416	13.9	10.0	1937 III	5	70.467	62.201	353.723	10.084	6.343	677.191	3.0167
S 1417	14.7	10.9	1937 IV	20	319.420	163.935	96.894	8.274	4.218	692.180	2.9730
1418	13.5	11.3	1939 II	10	225.624	322.944	355.243	7.198	11.793	1057.032	2.2419
1419	13.8	11.5	1929 IX	9	290.938	231.186	213.815	5.722	8.468	1021.798	2.2931
1420	14.3	10.9	1938 I	7	166.425	69.457	261.962	3.482	4.372	778.388	2.7492
1421	14.7	10.6	1944 XI	6	186.372	163.424	43.310	9.853	4.554	652.793	3.0914
1422	15.4	13.2	1936 X	2	344.143	169.812	201.743	2.658	9.653	1053.281	2.2472
1423	14.8	11.2	1936 IX	29	351.051	319.244	58.867	2.928	4.483	733.386	2.8605
1424	14.8	10.6	1945 VII	4	284.619	321.393	43.576	9.216	4.013	624.254	3.1849
1425	15.4	12.3	1937 V	3	33.741	337.990	186.272	12.945	5.807	839.131	2.6149
1426	13.6	10.5	1938 X	16	98.364	272.363	335.859	9.096	9.378	854.813	2.5828
1427	13.7	10.3	1937 V	27	313.226	239.734	79.181	9.399	12.233	778.376	2.7492
1428	13.4	9.9	1937 VII	6	303.666	249.029	116.245	17.330	8.089	752.507	2.8119
1429	14.8	11.8	1945 IV	9	293.981	293.868	48.890	7.677	19.823	871.193	2.5503
1430	14.5	11.5	1937 VIII	15	352.301	349.582	327.694	3.319	11.686	866.903	2.5587
1431	14.0	10.9	1937 VIII	15	338.266	221.083	118.092	14.075	10.554	836.303	2.6208
1432	14.4	11.8	1937 VIII	15	347.428	216.800	123.456	8.286	13.033	965.282	2.3818
1433	14.6	11.1	1937 X	30	354.402	92.303	322.377	8.266	9.706	759.005	2.7958
1434	13.6	9.7	1946 I	20	214.511	141.610	153.558	10.888	4.081	677.175	3.0167
S 1435	15.9	12.7	1937 I	11	357.829	265.188	190.436	4.026	14.340	824.290	2.6462
1436	13.4	9.2	1940 XII	2	50.649	33.319	261.356	13.845	3.235	635.632	3.1468
S 1437	14.2	7.5	1940 XII	13	347.820	133.816	315.517	20.485	2.711	299.423	5.1978
1438	15.2	11.0	1942 I	17	286.220	118.364	243.803	1.943	13.110	631.213	3.1615
1439	14.5	9.2	1944 VIII	18	195.887	118.253	36.647	4.210	6.813	452.558	3.9466
S 1440	15.4	11.2	1937 XI	26	359.810	349.934	47.274	2.296	10.428	630.687	3.1632
1441	15.4	12.2	1938 II	28	64.148	113.981	254.807	13.893	13.680	830.647	2.6327
1442	14.2	10.5	1938 II	28	128.890	125.828	222.260	1.235	4.335	727.388	2.8763
1443	14.4	10.6	1938 II	11	137.895	159.425	175.588	1.899	3.438	704.277	2.9389
1444	14.5	10.3	1938 III	1	250.110	307.005	304.562	17.760	7.557	632.127	3.1584
1445	14.5	10.4	1938 II	28	112.197	269.437	89.648	2.292	10.251	642.828	3.1233
1446	16.0	13.8	1938 II	19	290.390	184.179	162.378	5.269	5.730	1055.458	2.2441
1447	15.3	12.3	1938 II	25	34.625	63.532	35.940	4.830	2.167	878.789	2.5356
1448	16.5	13.9	1938 II	18	14.580	72.690	45.236	5.830	10.818	970.883	2.3726
1449	15.3	13.1	1938 III	8	293.423	130.456	110.812	6.635	8.107	1070.763	2.2227
1450	15.4	12.2	1940 I	17	24.702	11.272	75.000	4.070	0.000	0.000	2.6122

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
1451	15.5	13.4	1938	III 24	317.136	50.070	175.285	5.107	6.701	1084.720	2.2036
1452	15.5	11.4	1938	IV 11	42.941	92.643	23.092	14.121	11.554	648.551	3.1049
1453	14.8	13.7	1938	IV 6	291.517	254.230	6.846	23.674	1.584	1358.201	1.8968
1454	15.2	12.7	1936	III 8	23.589	132.215	352.877	5.110	8.217	975.092	2.3657
1455	14.8	12.6	1937	VI 11	26.516	98.278	128.617	7.736	7.232	1054.293	2.2457
1456	14.1	9.9	1944	XII 16	80.299	50.869	286.328	10.774	13.334	625.813	3.1796
1457	14.1	10.8	1945	IV 15	341.929	293.757	297.210	6.089	8.959	801.381	2.6964
1458	14.0	10.9	1937	X 25	63.986	98.441	182.172	12.495	10.612	834.428	2.6247
1459	14.2	10.0	1938	I 1	32.892	325.314	42.586	16.738	12.827	631.167	3.1616
1460	16.3	13.3	1937	XII 22	6.185	355.320	74.374	6.744	11.171	875.865	2.5412
1461	13.2	9.1	1938	I 1	39.423	331.806	105.431	15.303	2.820	641.668	3.1270
1462	15.9	11.7	1938	II 19	307.237	177.232	25.955	1.026	5.995	634.259	3.1513
1463	15.1	11.0	1938	III 8	81.061	74.628	331.627	7.307	11.580	635.713	3.1465
S 1464	16.2	12.3	1939	XII 3	282.667	57.595	87.410	11.553	2.589	682.252	3.0018
1465	14.3	10.4	1938	III 23	336.712	44.962	168.463	9.954	9.789	674.290	3.0253
1466	14.8	12.2	1938	VI 11	25.935	73.126	155.272	13.118	9.050	967.426	2.3783
S 1467	13.3	8.8	1938	VIII 10	1.771	335.878	328.082	21.868	7.196	567.680	3.3931
1468	15.0	12.9	1938	VIII 10	348.721	21.619	308.999	9.965	15.688	1090.827	2.1953
1469	13.8	9.7	1940	XI 21	90.046	203.852	189.578	13.430	3.559	642.981	3.1228
1470	15.4	11.2	1938	XI 29	47.155	324.715	359.899	3.247	4.181	632.606	3.1568
1471	15.4	12.0	1938	X 16	327.596	90.938	322.548	13.658	6.628	792.681	2.7161
1472	16.0	13.8	1938	XI 18	34.213	317.386	45.209	4.575	11.465	1062.635	2.2340
1473	16.2	13.1	1938	XI 16	43.532	127.129	217.011	13.625	13.960	856.842	2.5787
1474	14.4	11.0	1941	II 23	48.376	82.264	324.894	26.752	29.336	785.530	2.7325
1475	14.4	11.9	1925	I 1	343.648	200.669	200.362	4.474	9.791	986.333	2.3478
1476	15.2	12.9	1936	XI 19	39.955	348.351	330.722	6.334	10.921	1029.607	2.2815
1477	16.1	11.9	1938	II 25	47.753	105.456	320.879	15.713	16.699	626.423	3.1776
1478	16.0	13.2	1938	II 25	21.850	159.412	318.954	7.908	5.589	917.470	2.4638
1479	15.6	12.4	1938	II 17	27.752	77.085	18.976	7.323	11.244	811.128	2.6747
1480	15.8	13.7	1938	III 8	28.920	63.553	63.699	4.869	6.318	1085.853	2.2020
1481	14.1	10.2	1938	II 11	143.598	22.817	354.762	3.580	1.036	677.405	3.0161
1482	15.1	11.4	1938	III 24	249.254	211.392	71.685	2.990	2.001	728.724	2.8727
1483	15.9	12.5	1945	XII 11	267.737	89.877	72.509	4.504	10.494	791.257	2.7193
1484	13.9	10.5	1944	IX 27	159.701	125.425	73.227	17.260	11.843	782.848	2.7388
S 1485	14.5	10.6	1938	X 9	1.532	40.823	298.705	8.956	6.815	673.960	3.0263
1486	15.1	13.0	1938	VIII 28	7.879	343.870	338.093	0.083	7.160	1088.449	2.1985
1487	14.3	10.2	1940	III 10	330.099	100.165	97.886	2.467	7.155	638.964	3.1358
1488	15.6	11.6	1939	II 16	12.842	113.281	355.301	10.547	6.959	669.883	3.0386
1489	15.3	11.1	1939	V 18	34.128	10.326	155.823	2.402	9.699	627.369	3.1744
S 1490	13.2	10.7	1936	VI 1	293.517	89.079	254.598	10.026	8.874	982.897	2.3532
1491	14.8	10.6	1938	IV 12	41.606	155.920	315.120	3.776	10.212	620.989	3.1961
1492	15.8	13.8	1938	III 29	337.369	79.790	137.803	6.058	6.651	1107.198	2.1736
1493	14.1	11.4	1938	IX 1	25.233	359.741	331.099	2.591	11.598	936.325	2.4306
1494	15.7	13.6	1938	X 3	350.117	182.940	195.009	2.444	7.531	1094.778	2.1900
1495	15.9	12.7	1938	X 16	73.092	267.490	13.514	12.769	8.812	827.546	2.6392
1496	16.0	13.9	1938	X 16	63.438	359.129	294.636	2.503	9.311	1083.645	2.2050
1497	15.9	12.2	1938	X 16	45.528	20.236	302.393	1.071	4.829	720.115	2.8956
1498	16.8	12.7	1938	X 16	3.552	93.398	266.853	12.632	14.143	651.590	3.0952
1499	15.5	12.3	1938	XI 17	63.333	72.440	240.295	12.186	10.764	813.349	2.6698
1500	16.5	14.3	1938	X 22	359.675	15.666	19.964	7.460	10.925	1056.919	2.2420

No.	m g		Epoch 0 <sup>h</sup> UT M			$\omega$	$\Omega$	i	$\phi$	n	a
	m	m			°	°	°	°	°	°	
						1950.0					
1501	16.7	13.7	1938 X	22	358.931	11.292	16.971	7.324	13.551	872.928	2.5469
1502	14.4	11.0	1939 I	17	332.656	271.591	205.055	4.060	5.116	786.123	2.7311
1503	15.2	12.0	1939 II	9	352.058	174.993	317.239	12.378	5.932	833.626	2.6264
1504	15.4	12.8	1939 IV	22	37.753	50.188	95.029	11.054	9.139	955.011	2.3988
1505	13.8	10.6	1939 V	17	359.959	341.008	248.737	14.423	7.757	819.398	2.6567
1506	14.7	11.7	1939 VI	26	347.230	42.228	235.279	12.649	15.055	860.970	2.5705
1507	16.9	14.4	1939 X	8	16.857	48.661	293.221	9.268	14.164	996.816	2.3313
1508	16.7	13.2	1938 X	22	313.610	92.470	14.841	28.685	24.797	769.594	2.7701
S 1509	13.6	12.6	1939 I	1	276.797	267.061	283.286	22.320	1.881	1391.117	1.8668
1510	14.2	11.0	1939 III	21	28.772	163.016	331.856	11.805	8.577	813.494	2.6695
1511	15.1	12.6	1939 III	23	357.676	95.068	81.832	4.073	6.295	980.330	2.3573
1512	15.6	10.3	1939 IV	18	315.103	248.316	10.670	6.514	9.862	451.363	3.9535
1513	15.0	12.9	1940 VI	4	41.057	25.342	136.098	3.975	5.704	1092.499	2.1931
1514	14.5	12.3	1906 IX	2	7.033	178.446	146.009	4.513	11.467	1057.680	2.2410
1515	15.0	12.0	1936 XII	4	16.663	351.566	49.538	10.909	13.041	860.467	2.5715
1516	14.1	11.0	1938 II	12	311.666	90.113	126.740	8.695	10.908	837.454	2.6184
1517	13.8	10.4	1941 I	22	153.653	199.250	64.807	5.190	3.086	791.791	2.7181
1518	15.8	13.6	1938 X	26	337.294	35.716	27.821	6.732	8.203	1068.639	2.2256
1519	16.6	12.5	1938 X	22	23.545	334.463	17.003	12.565	13.907	642.044	3.1258
1520	15.5	11.4	1938 XI	26	45.297	113.875	254.294	15.169	5.828	647.951	3.1068
1521	16.4	12.8	1938 XI	18	349.503	47.525	12.988	15.055	7.853	737.352	2.8503
1522	15.8	13.3	1938 XI	26	336.615	28.827	60.595	5.330	4.110	976.001	2.3643
1523	13.9	11.7	1936 I	1	1.494	203.578	326.866	5.116	4.137	1050.101	2.2517
1524	16.1	12.0	1939 X	18	27.403	359.540	348.609	12.733	7.060	645.848	3.1135
1525	17.5	14.2	1939 X	18	23.900	62.173	280.363	5.899	15.384	802.089	2.6948
1526	16.8	14.4	1939 X	18	343.553	70.979	337.288	6.216	10.850	1007.285	2.3150
1527	15.6	13.4	1939 XI	12	58.935	303.037	16.312	5.195	11.430	1067.671	2.2270
1528	14.6	11.9	1940 IV	1	325.202	57.982	139.563	8.514	8.353	945.142	2.4155
1529	16.0	10.6	1938 II	25	68.074	303.483	101.458	8.991	11.108	444.238	3.9957
1530	16.6	14.4	1938 X	3	354.732	83.176	286.223	4.420	11.482	1051.987	2.2490
S 1531	14.4	11.2	1938 X	29	322.909	141.230	279.440	12.394	8.782	832.652	2.6284
1532	15.5	11.6	1938 X	16	269.856	124.907	331.600	8.818	2.634	681.263	3.0047
1533	15.3	11.4	1939 II	17	345.441	2.718	157.427	10.666	2.425	679.109	3.0110
1534	16.0	12.6	1939 I	20	18.836	39.885	63.074	9.887	14.689	787.594	2.7277
1535	16.4	12.3	1939 X	8	50.269	34.831	266.760	6.153	11.842	634.068	3.1520
1536	16.4	14.3	1939 X	19	10.268	169.077	195.723	1.520	11.275	1084.091	2.2044
1537	15.8	11.8	1940 X	5	344.054	145.947	231.530	3.785	17.756	667.704	3.0452
1538	16.0	13.5	1940 XII	1	17.425	11.817	343.357	9.469	12.579	978.081	2.3610
1539	14.1	10.0	1950 I	0	237.644	247.430	143.679	1.704	11.467	637.643	3.1402
1540	15.2	11.6	1938 X	22	256.996	111.680	53.105	12.000	4.795	738.338	2.8477
1541	15.8	12.3	1939 III	23	341.439	186.510	2.049	4.912	3.871	770.072	2.7690
1542	15.6	11.5	1945 V	10	222.496	161.253	212.798	2.731	6.488	651.825	3.0944
1543	15.1	11.9	1941 IX	19	18.340	23.001	288.637	11.168	18.976	831.685	2.6305
1544	15.4	12.8	1941 X	16	341.803	354.790	59.886	3.347	5.963	969.801	2.3744
1545	15.9	12.4	1941 X	16	283.191	86.216	52.974	2.980	13.762	769.113	2.7713
1546	14.2	10.0	1941 XI	17	300.046	272.414	192.035	16.099	7.963	631.330	3.1611
1547	14.6	11.4	1944 VIII	5	251.844	151.247	291.854	11.673	14.962	825.494	2.6436
1548	14.8	11.3	1935 IV	10	349.208	84.419	117.445	16.554	4.521	762.934	2.7862
1549	15.2	13.0	1937 IV	3	86.657	5.794	85.194	5.553	4.743	1064.329	2.2316
1550	15.0	12.0	1937 XII	11	36.720	309.332	65.360	8.899	17.725	871.902	2.5489

No.	m	g	Epoch	0 <sup>h</sup> UT	M	$\omega$	$\Omega$ 1950.0	i	$\phi$	n	a
	m	m			°	°	°	°	°	"	
1551	15.2	12.6	1938	III	6	188.210	230.366	107.225	3.763	3.776	956.894 2.3957
1552	15.6	11.7	1938	III	6	106.968	36.461	10.913	9.894	5.749	679.624 3.0095
1553	14.7	11.0	1945	II	13	5.418	21.086	111.186	3.235	5.812	716.088 2.9064
1554	14.3	11.2	1940	IX	8	5.439	130.432	217.599	12.134	11.582	836.585 2.6202
1555	15.8	12.5	1941	IX	15	354.088	44.483	319.180	6.089	15.830	805.803 2.6865
1556	14.1	9.5	1942	III	2	128.485	259.710	93.188	15.792	6.361	559.861 3.4247
1557	14.1	10.2	1942	II	15	122.827	0.067	355.914	10.328	6.360	680.202 3.0078
1558	15.4	11.1	1942	II	5	65.626	300.221	111.600	10.552	4.204	616.421 3.2118
1559	15.3	12.7	1942	II	12	321.514	213.679	328.368	3.216	7.677	960.029 2.3905
1560	14.4	11.0	1943	I	3	36.165	91.754	290.164	6.284	12.287	806.202 2.6856
1561	14.4	10.1	1941	III	7	261.104	34.788	232.672	4.363	9.021	628.744 3.1697
1562	14.0	11.8	1943	IV	8	333.907	80.538	129.447	4.889	4.372	1068.044 2.2264
1563	14.0	12.3	1943	III	17	8.561	111.314	53.778	5.976	4.958	1093.608 2.1916

No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg
1	10 30	7.6	125	61	6 13	10.8	92	121	2 17	11.7	55	181	8 3	12.3	105
2	8 27	8.9	111	62	6 8	12.9	90	122	8 18	11.7	109	182	7 3	11.6	97
3	6 17	9.8	93	63	7 7	9.1	99	123	7 29	12.1	104	183	.	.	..
4	.	.	..	64	11 22	10.2	130	124	1 18	10.5	45	184	5 7	12.0	81
5	7 24	10.8	103	65	12 7	11.6	134	125	1 14	11.6	43	185	5 25	10.6	87
6	.	.	..	66	3 18	12.6	65	126	4 29	11.9	78	186	4 8	11.9	73
7	11 8	6.8	127	67	2 27	12.0	58	127	1 29	10.2	49	187	9 28	12.3	117
8	4 29	9.8	78	68	.	.	..	128	3 11	11.2	63	188	6 15	12.2	92
9	3 5	8.8	61	69	.	.	..	129	7 4	9.1	98	189	10 2	11.3	119
10	12 20	10.0	137	70	12 4	11.5	133	130	7 13	10.4	100	190	8 1	12.7	105
11	10 22	9.0	123	71	4 14	9.9	74	131	.	.	..	191	9 23	11.5	117
12	12 25	10.6	139	72	7 28	10.4	104	132	10 29	12.0	124	192	5 16	10.1	83
13	3 5	9.4	61	73	11 30	11.8	132	133	5 11	10.5	82	193	5 14	14.3	83
14	6 27	9.5	95	74	.	.	..	134	10 10	10.7	121	194	4 20	10.9	76
15	.	.	..	75	1 30	12.8	49	135	8 18	9.0	109	195	3 9	12.4	62
16	2 27	10.2	59	76	5 6	12.5	80	136	5 22	11.1	85	196	9 24	10.4	117
17	12 2	10.8	133	77	3 7	11.2	61	137	10 5	11.1	119	197	5 21	12.5	85
18	.	.	..	78	.	.	..	138	7 8	10.9	99	198	2 6	11.9	51
19	6 30	10.1	96	79	9 17	9.7	116	139	7 16	11.3	101	199	8 9	11.6	107
20	.	.	..	80	3 30	11.6	70	140	12 24	12.3	139	200	8 19	11.1	109
21	11 7	9.7	127	81	.	.	..	141	10 11	10.1	121	201	1 21	12.6	45
22	.	.	..	82	.	.	..	142	4 22	11.3	76	202	4 24	10.6	77
23	1 7	9.0	41	83	.	.	..	143	.	.	..	203	10 15	11.4	122
24	1 31	10.1	49	84	2 11	12.5	52	144	2 23	11.6	57	204	2 11	12.2	52
25	12 4	11.2	134	85	9 14	9.8	115	145	.	.	..	205	5 27	12.8	87
26	.	.	..	86	9 10	11.4	114	146	7 15	10.9	100	206	10 4	11.9	119
27	.	.	..	87	12 25	12.1	139	147	7 8	12.5	99	207	5 24	11.7	86
28	5 7	10.1	80	88	1 18	11.7	45	148	4 6	11.8	72	208	8 10	12.2	107
29	.	.	..	89	5 19	10.5	84	149	.	.	..	209	12 29	11.8	140
30	2 2	10.0	50	90	1 27	12.5	48	150	9 30	10.8	118	210	.	.	..
31	5 20	11.8	84	91	2 18	10.5	55	151	.	.	..	211	8 18	11.7	108
32	.	.	..	92	8 23	10.5	110	152	10 8	12.2	120	212	5 6	12.7	80
33	.	.	..	93	1 3	11.6	40	153	12 18	13.4	137	213	.	.	..
34	2 4	10.9	51	94	.	.	..	154	6 20	11.0	94	214	1 9	12.0	42
35	.	.	..	95	8 26	10.8	111	155	.	.	..	215	.	.	..
36	.	.	..	96	.	.	..	156	10 30	12.4	125	216	7 27	9.7	103
37	2 7	9.9	52	97	4 28	11.6	78	157	3 23	13.0	67	217	3 27	13.8	69
38	2 25	10.8	58	98	2 2	11.6	50	158	10 5	12.1	120	218	.	.	..
39	.	.	..	99	8 31	13.7	112	159	.	.	..	219	2 13	12.5	53
40	.	.	..	100	1 5	12.6	41	160	.	.	..	220	.	.	..
41	.	.	..	101	10 1	10.0	118	161	11 22	11.2	130	221	9 2	10.8	112
42	3 25	11.3	68	102	.	.	..	162	11 3	12.5	126	222	.	.	..
43	.	.	..	103	5 25	10.1	86	163	11 19	10.6	129	223	2 18	12.7	55
44	3 3	9.1	60	104	12 14	11.2	136	164	3 5	12.9	61	224	5 30	11.5	88
45	7 3	10.3	97	105	1 16	11.6	44	165	5 3	10.9	79	225	12 17	13.8	137
46	.	.	..	106	9 9	10.7	114	166	11 30	11.3	132	226	1 2	14.1	40
47	.	.	..	107	.	.	..	167	4 8	13.0	73	227	1 8	13.3	42
48	.	.	..	108	11 18	11.7	129	168	2 3	11.6	50	228	5 18	14.3	84
49	4 4	12.1	71	109	5 8	13.4	81	169	2 25	12.1	57	229	.	.	..
50	6 14	11.8	92	110	4 13	10.8	74	170	4 3	11.9	71	230	3 26	10.7	68
51	11 3	10.2	126	111	.	.	..	171	10 17	12.5	122	231	9 29	12.5	118
52	7 10	10.8	99	112	.	.	..	172	3 17	11.0	64	232	.	.	..
53	3 23	11.2	67	113	.	.	..	173	1 7	10.8	41	233	1 25	11.8	46
54	6 30	9.7	97	114	.	.	..	174	.	.	..	234	.	.	..
55	1 22	11.0	46	115	4 13	11.4	74	175	10 26	11.5	124	235	12 18	12.5	137
56	.	.	..	116	1 31	10.0	49	176	1 26	12.3	47	236	12 17	11.2	137
57	5 28	11.2	87	117	4 25	11.5	77	177	.	.	..	237	1 26	13.2	48
58	12 30	11.6	140	118	.	.	..	178	.	.	..	238	4 27	12.2	78
59	2 4	11.2	51	119	5 17	10.9	83	179	5 23	11.7	85	239	.	.	..
60	2 14	10.2	53	120	12 31	11.8	140	180	7 23	14.1	102	240	2 23	12.5	57



## Opposition Dates

No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg
241	6 22	11.0	94	301	5 31	12.3	88	361	1 5	12.1	40	421	4 15	15.5	75
242	10 30	12.5	125	302	. .	..	..	362	4 9	11.2	73	422	. .	..	..
243	11 1	13.1	125	303	4 15	12.3	74	363	1 5	11.7	41	423	3 23	11.2	68
244	4 9	14.5	73	304	3 4	13.4	60	364	7 19	12.0	101	424	. .	..	..
245	5 22	13.3	85	305	6 19	13.3	93	365	11 8	11.3	127	425	4 16	12.8	75
246	3 16	11.6	64	306	12 3	11.1	133	366	. .	..	..	426	11 9	11.8	128
247	. .	..	..	307	6 7	13.8	90	367	10 19	12.7	122	427	4 9	12.9	73
248	5 3	12.7	79	308	8 19	10.8	109	368	6 18	12.6	93	428	. .	..	..
249	6 23	13.8	95	309	2 15	13.3	54	369	. .	..	..	429	8 22	12.1	110
250	10 25	11.0	123	310	8 27	14.0	111	370	12 23	12.8	138	430	4 11	14.0	74
251	1 10	13.2	42	311	11 22	12.9	130	371	7 18	11.4	101	431	12 11	12.8	135
252	11 2	12.6	125	312	10 24	12.9	123	372	5 9	11.6	81	432	8 3	10.4	105
253	1 18	14.3	45	313	. .	..	..	373	6 9	12.7	90	433	6 2	11.6	89
254	. .	..	..	314	9 18	13.1	116	374	3 24	11.4	68	434	11 8	12.0	127
255	10 16	13.6	122	315	3 12	14.9	63	375	5 18	10.8	84	435	5 6	12.5	80
256	. .	..	..	316	7 20	13.9	102	376	1 19	12.4	45	436	3 19	13.3	65
257	5 23	13.4	86	317	12 15	12.3	136	377	. .	..	..	437	. .	..	..
258	. .	..	..	318	5 13	13.4	82	378	6 2	13.0	89	438	11 9	12.1	128
259	5 24	11.4	86	319	8 8	13.9	106	379	8 4	11.7	105	439	7 28	13.0	104
260	2 19	14.4	55	320	5 16	14.1	83	380	2 16	13.2	55	440	8 30	13.4	112
261	12 25	11.3	139	321	2 12	13.1	53	381	5 31	11.6	88	441	3 19	12.5	65
262	9 23	13.3	117	322	12 31	12.0	140	382	11 22	13.0	130	442	9 13	12.3	115
263	2 15	13.6	54	323	. .	..	..	383	8 8	13.3	106	443	12 9	12.4	135
264	11 7	11.3	127	324	8 27	7.6	111	384	6 6	12.5	89	444	11 24	10.7	131
265	1 27	14.0	48	325	10 29	11.4	124	385	3 29	9.6	69	445	2 23	13.5	56
266	3 8	12.4	62	326	. .	..	..	386	. .	..	..	446	. .	..	..
267	5 25	13.4	86	327	2 17	13.3	55	387	. .	..	..	447	. .	..	..
268	6 21	12.0	94	328	4 4	12.4	71	388	5 9	11.7	81	448	4 4	14.1	71
269	11 29	13.6	132	329	5 28	12.0	87	389	11 23	11.3	131	449	7 26	12.8	103
270	. .	..	..	330	7 28	13.6	104	390	7 7	13.8	99	450	. .	..	..
271	3 16	13.2	64	331	12 8	12.3	134	391	10 30	11.1	125	451	11 12	10.3	128
272	. .	..	..	332	2 11	13.0	52	392	7 19	11.8	101	452	. .	..	..
273	1 27	12.4	48	333	8 8	12.2	106	393	1 10	12.6	42	453	12 18	12.8	137
274	6 10	13.0	91	334	11 3	12.1	126	394	3 8	13.9	62	454	4 24	11.0	77
275	. .	..	..	335	11 27	12.2	132	395	2 4	13.3	50	455	4 7	12.8	72
276	. .	..	..	336	. .	..	..	396	7 4	12.1	98	456	8 10	12.7	107
277	5 5	13.4	79	337	9 11	11.5	114	397	2 13	14.7	53	457	4 16	15.9	75
278	3 27	12.0	69	338	11 4	12.0	126	398	7 14	14.6	100	458	12 2	11.5	133
279	5 22	13.6	85	339	2 16	13.3	54	399	. .	..	..	459	12 29	12.6	140
280	6 19	14.9	93	340	11 19	12.2	129	400	9 16	15.7	115	460	2 21	14.3	56
281	. .	..	..	341	5 21	12.7	85	401	11 22	12.9	130	461	5 7	14.8	80
282	5 24	13.7	86	342	1 14	12.1	43	402	. .	..	..	462	4 25	13.7	77
283	1 14	12.0	43	343	5 27	14.6	87	403	6 9	12.3	90	463	4 10	15.1	73
284	5 14	12.0	82	344	12 19	13.0	137	404	12 10	13.7	135	464	. .	..	..
285	3 5	15.9	61	345	3 14	11.3	64	405	. .	..	..	465	10 7	14.2	120
286	11 2	13.2	126	346	7 7	11.5	98	406	1 15	13.9	44	466	8 15	12.1	108
287	10 4	10.8	119	347	12 3	12.0	133	407	. .	..	..	467	3 5	14.5	61
288	10 15	13.6	121	348	8 1	13.2	105	408	. .	..	..	468	4 23	13.7	77
289	. .	..	..	349	12 4	9.5	134	409	5 10	10.2	81	469	5 7	11.9	80
290	2 21	12.5	56	350	12 5	11.8	134	410	6 27	10.2	95	470	10 18	13.4	122
291	8 3	14.1	105	351	11 25	11.8	131	411	3 5	12.8	61	471	. .	..	..
292	7 26	12.3	103	352	12 5	11.3	134	412	2 26	11.8	58	472	. .	..	..
293	1 26	12.3	47	353	. .	..	..	413	3 30	13.9	70	473	2 10	13.4	52
294	12 11	13.8	135	354	10 3	10.5	119	414	12 20	13.0	137	474	2 13	14.0	53
295	. .	..	..	355	7 5	13.6	98	415	1 10	9.9	42	475	9 2	10.5	113
296	12 9	12.7	135	356	. .	..	..	416	3 22	11.0	67	476	2 28	11.6	59
297	10 15	12.9	121	357	12 15	11.9	136	417	2 24	12.0	57	477	. .	..	..
298	6 5	13.7	89	358	3 30	12.8	70	418	. .	..	..	478	7 6	11.4	98
299	10 31	14.0	125	359	3 9	13.1	62	419	12 2	12.2	133	479	. .	..	..
300	8 15	12.3	108	360	7 15	12.3	100	420	10 7	12.3	120	480	1 12	11.4	43

# Opposition Dates

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No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg
481	.	.	..	541	10	5	13.0	601	.	.	..	661	9	12	12.9
482	.	.	..	542	4	21	13.4	602	9	16	10.6	662	.	.	..
483	4	25	12.6	543	10	19	11.9	603	3	30	13.1	663	10	5	13.8
484	10	28	12.9	544	.	.	..	604	5	27	13.1	664	5	8	12.8
485	2	28	10.7	545	3	2	12.8	605	9	23	12.1	665	8	2	12.2
486	.	.	..	546	.	.	..	606	6	21	13.0	666	.	.	..
487	.	.	..	547	1	7	12.2	607	1	29	12.6	667	6	14	14.3
488	5	21	11.1	548	3	16	13.2	608	6	13	14.2	668	.	.	..
489	9	21	12.7	549	8	1	14.3	609	3	5	13.0	669	.	.	..
490	8	13	12.1	550	1	2	12.8	610	4	2	16.8	670	.	.	..
491	7	19	12.7	551	3	30	13.1	611	9	28	12.1	671	12	13	12.7
492	12	25	13.3	552	8	5	11.9	612	.	.	..	672	1	26	14.0
493	12	30	13.9	553	10	12	13.2	613	.	.	..	673	.	.	..
494	6	11	11.9	554	8	8	10.9	614	.	.	..	674	8	4	11.6
495	3	5	13.0	555	8	8	14.6	615	3	17	12.4	675	2	21	11.3
496	8	3	13.5	556	.	.	..	616	11	9	12.5	676	4	5	13.0
497	2	1	14.0	557	2	3	13.1	617	3	26	13.3	677	8	30	13.2
498	2	4	12.3	558	9	11	12.3	618	.	.	..	678	4	9	13.7
499	8	19	13.2	559	10	28	12.7	619	.	.	..	679	4	3	12.4
500	6	10	12.1	560	6	5	14.0	620	6	14	13.3	680	1	26	14.3
501	.	.	..	561	8	28	14.4	621	4	17	14.0	681	4	14	14.3
502	.	.	..	562	4	20	13.2	622	9	4	11.6	682	3	21	15.0
503	.	.	..	563	9	29	10.2	623	7	13	13.2	683	6	18	12.3
504	8	4	11.7	564	11	4	13.9	624	7	28	13.2	684	8	20	13.4
505	12	9	10.3	565	5	28	12.8	625	6	13	11.3	685	.	.	..
506	6	27	13.2	566	3	9	12.4	626	.	.	..	686	11	28	13.6
507	.	.	..	567	.	.	..	627	3	21	13.3	687	2	22	15.3
508	2	5	12.4	568	3	23	12.8	628	12	28	12.5	688	2	3	14.2
509	7	25	11.4	569	5	18	13.2	629	5	30	14.2	689	5	2	15.0
510	.	.	..	570	3	22	13.2	630	9	6	14.0	690	6	19	11.9
511	3	29	9.7	571	.	.	..	631	.	.	..	691	2	4	13.0
512	1	29	13.3	572	.	.	..	632	9	23	14.7	692	4	29	13.2
513	1	2	12.0	573	10	5	12.5	633	.	.	..	693	2	24	12.9
514	.	.	..	574	1	29	13.5	634	.	.	..	694	4	6	13.4
515	9	19	13.3	575	.	.	..	635	8	26	12.5	695	1	26	11.7
516	10	11	12.1	576	11	25	12.7	636	3	3	13.3	696	6	12	14.0
517	7	20	13.5	577	3	11	13.4	637	4	27	13.5	697	11	6	11.9
518	7	24	12.0	578	.	.	..	638	2	8	13.4	698	11	28	13.6
519	2	9	12.8	579	12	7	11.7	639	2	24	12.7	699	3	3	16.4
520	3	19	14.2	580	2	18	13.7	640	10	22	13.2	700	8	7	13.3
521	6	4	13.2	581	2	19	13.7	641	11	22	13.6	701	8	15	13.2
522	4	8	13.0	582	.	.	..	642	10	13	13.5	702	.	.	..
523	7	11	13.6	583	2	21	12.3	643	3	18	13.7	703	2	22	14.3
524	3	16	12.8	584	3	23	12.7	644	3	25	13.9	704	8	11	9.8
525	3	16	14.2	585	.	.	..	645	9	24	13.3	705	2	14	11.9
526	.	.	..	586	.	.	..	646	.	.	..	706	.	.	..
527	.	.	..	587	9	22	15.1	647	2	26	13.4	707	3	13	14.3
528	2	5	12.3	588	7	12	15.0	648	11	5	12.2	708	6	23	13.1
529	6	15	13.3	589	8	29	12.6	649	5	2	15.5	709	4	19	12.5
530	12	4	12.4	590	1	26	12.8	650	1	18	14.4	710	11	10	14.8
531	8	18	13.8	591	9	13	14.5	651	5	6	14.0	711	.	.	..
532	9	17	10.7	592	.	.	..	652	7	9	13.0	712	10	31	10.2
533	10	9	13.6	593	6	22	13.4	653	7	1	12.9	713	1	6	13.2
534	1	11	12.6	594	.	.	..	654	6	10	11.6	714	3	7	11.2
535	12	3	11.8	595	7	22	11.7	655	6	30	12.8	715	2	28	13.7
536	.	.	..	596	6	28	11.1	656	.	.	..	716	2	5	13.2
537	7	24	11.6	597	12	12	12.8	657	6	16	13.5	717	2	15	14.9
538	3	26	14.0	598	3	11	12.8	658	2	26	13.7	718	6	3	11.7
539	1	30	13.5	599	4	1	13.5	659	8	3	13.8	719	3	4	19.9
540	8	12	12.5	600	.	.	..	660	12	21	11.2	720	.	.	..

## Opposition Dates

No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg				
721	2	2	14.0	50	781	12	4	13.5	133	841	12	23	12.9	138	901	3	22	14.5	67
722	.	.	..	..	782	8	17	13.3	108	842	1	24	14.0	46	902	3	19	15.3	65
723	10	9	13.0	120	783	9	22	12.2	116	843	10	1	13.6	118	903	9	2	13.4	112
724	3	25	16.3	68	784	4	10	12.0	73	844	2	11	13.3	53	904	5	19	13.8	84
725	5	24	14.4	86	785	3	12	11.6	63	845	.	.	..	..	905	6	10	12.9	91
726	5	10	14.3	81	786	1	6	13.4	41	846	5	7	14.7	80	906	9	9	11.6	114
727	9	3	12.5	113	787	8	3	12.0	105	847	7	7	13.2	98	907	.	.	..	..
728	6	22	14.5	94	788	4	21	11.9	76	848	6	6	13.7	90	908	4	20	13.3	76
729	12	14	13.2	136	789	.	.	..	..	849	5	17	10.7	83	909	4	27	13.1	77
730	11	17	15.7	129	790	11	15	13.0	129	850	3	8	12.9	62	910	11	28	13.9	132
731	1	17	13.2	44	791	6	22	13.0	94	851	9	15	14.0	115	911	7	27	13.7	104
732	6	11	12.9	91	792	9	17	13.3	116	852	.	.	..	..	912	5	12	12.1	82
733	4	1	12.8	70	793	.	.	..	..	853	1	8	13.9	42	913	.	.	..	..
734	.	.	..	..	794	8	18	12.9	109	854	.	.	..	..	914	12	26	13.1	139
735	5	8	12.9	81	795	12	16	13.0	136	855	.	.	..	..	915	6	28	14.4	96
736	4	27	12.6	78	796	4	23	13.4	76	856	7	14	13.2	100	916	5	1	14.4	78
737	1	15	12.3	44	797	.	.	..	..	857	.	.	..	..	917	3	26	14.5	69
738	8	1	13.6	105	798	1	18	13.1	44	858	.	.	..	..	918	4	24	14.2	77
739	10	26	12.9	124	799	1	21	12.8	45	859	2	25	13.1	58	919	5	12	13.6	82
740	8	21	13.1	110	800	1	26	14.0	47	860	7	24	12.2	103	920	4	5	13.3	72
741	11	16	13.1	129	801	12	20	13.8	137	861	7	24	12.2	103	921	8	27	12.9	111
742	9	25	11.9	117	802	.	.	..	..	862	6	30	13.1	97	922	.	.	..	..
743	6	23	13.2	95	803	11	19	13.2	129	863	5	16	12.8	83	923	4	18	15.0	75
744	2	11	13.2	52	804	.	.	..	..	864	.	.	..	..	924	3	20	13.5	66
745	.	.	..	..	805	12	23	13.8	138	865	1	26	12.8	47	925	2	25	11.0	57
746	5	9	11.9	81	806	11	28	13.4	132	866	8	14	12.4	108	926	7	11	13.4	99
747	8	13	10.3	107	807	5	18	13.6	84	867	10	21	13.9	123	927	12	11	12.8	135
748	7	6	14.3	98	808	11	28	12.4	132	868	.	.	..	..	928	.	.	..	..
749	7	22	12.8	102	809	.	.	..	..	869	1	17	15.2	44	929	3	29	13.3	69
750	2	23	13.0	57	810	6	3	14.3	89	870	.	.	..	..	930	5	2	13.3	79
751	10	20	10.6	123	811	1	11	14.0	42	871	6	11	13.3	91	931	.	.	..	..
752	1	9	12.6	42	812	.	.	..	..	872	.	.	..	..	932	6	4	12.0	89
753	.	.	..	..	813	4	27	13.3	78	873	6	15	13.2	93	933	10	11	15.2	121
754	8	9	13.1	107	814	6	1	13.4	88	874	10	30	13.7	125	934	7	3	14.2	97
755	2	4	13.2	51	815	4	21	13.6	76	875	12	11	14.2	135	935	.	.	..	..
756	.	.	..	..	816	1	20	13.2	45	876	3	18	14.5	65	936	6	25	12.6	95
757	5	7	13.1	81	817	6	29	13.9	96	877	.	.	..	..	937	11	21	14.2	130
758	6	30	11.8	97	818	8	18	12.8	109	878	2	27	17.9	59	938	5	24	14.5	86
759	9	5	12.6	113	819	12	16	14.2	136	879	.	.	..	..	939	10	19	13.0	122
760	9	29	12.8	118	820	12	28	13.6	140	880	4	17	16.1	75	940	.	.	..	..
761	10	3	13.5	119	821	.	.	..	..	881	10	18	14.3	122	941	6	30	14.5	96
762	10	7	11.8	120	822	6	3	14.2	89	882	2	2	14.4	50	942	6	25	14.2	95
763	.	.	..	..	823	9	13	14.0	115	883	8	20	12.3	109	943	9	13	14.1	115
764	9	16	13.0	115	824	.	.	..	..	884	2	13	14.3	53	944	9	12	16.2	115
765	1	30	14.6	49	825	10	9	13.4	121	885	3	2	14.5	59	945	3	4	12.6	60
766	3	13	13.0	63	826	2	24	13.5	57	886	2	6	14.2	51	946	12	27	13.0	140
767	12	23	13.9	138	827	10	20	13.8	123	887	6	9	18.9	90	947	.	.	..	..
768	.	.	..	..	828	1	14	14.0	43	888	7	18	13.4	101	948	1	14	13.1	43
769	10	10	12.7	121	829	1	22	13.1	46	889	11	11	11.7	128	949	2	16	13.1	54
770	.	.	..	..	830	1	6	11.8	41	890	11	8	13.8	127	950	6	22	13.4	94
771	9	1	13.5	112	831	.	.	..	..	891	5	21	13.5	85	951	.	.	..	..
772	6	30	11.9	96	832	1	1	13.4	40	892	5	14	13.5	83	952	10	16	11.8	122
773	12	20	12.9	137	833	8	18	13.5	109	893	.	.	..	..	953	.	.	..	..
774	1	25	13.2	47	834	.	.	..	..	894	11	3	13.5	126	954	3	7	14.6	61
775	6	14	14.0	92	835	1	22	14.0	46	895	7	16	13.6	101	955	11	26	15.3	131
776	10	6	10.1	120	836	2	25	15.1	58	896	.	.	..	..	956	.	.	..	..
777	12	6	13.8	134	837	7	21	13.4	102	897	10	26	13.9	123	957	.	.	..	..
778	.	.	..	..	838	.	.	..	..	898	.	.	..	..	958	.	.	..	..
779	11	22	11.2	130	839	.	.	..	..	899	6	2	14.1	88	959	4	9	15.2	73
780	1	29	13.0	48	840	3	4	13.2	60	900	.	.	..	..	960	4	6	14.9	72

# Opposition Dates

No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg
961	8 29	13.2	112	1021	4 11	12.6	74	1081	5 7	15.3	80	1141	.	.	..
962	.	.	..	1022	4 21	12.3	76	1082	4 7	14.5	72	1142	2 16	15.2	54
963	6 4	15.1	89	1023	8 16	13.8	108	1083	7 26	15.6	103	1143	7 29	14.4	104
964	8 22	13.8	110	1024	9 8	14.2	114	1084	.	.	..	1144	6 20	13.7	94
965	5 26	16.0	87	1025	1 22	13.7	45	1085	2 13	13.9	53	1145	.	.	..
966	9 25	12.8	117	1026	11 24	14.9	131	1086	3 1	12.9	59	1146	12 13	14.5	136
967	8 9	12.8	107	1027	.	.	..	1087	6 28	13.8	96	1147	12 3	15.4	133
968	1 12	11.3	43	1028	8 24	13.5	110	1088	.	.	..	1148	.	.	..
969	5 19	15.2	84	1029	.	.	..	1089	.	.	..	1149	3 15	14.0	64
970	2 7	14.5	51	1030	8 15	14.4	108	1090	7 3	15.7	97	1150	2 2	16.0	50
971	12 21	11.9	138	1031	10 26	13.3	124	1091	2 26	14.5	58	1151	5 12	15.9	82
972	9 16	11.9	115	1032	9 14	12.7	115	1092	11 28	14.0	132	1152	9 30	13.6	118
973	6 29	13.8	96	1033	1 24	14.0	46	1093	5 11	12.8	82	1153	11 1	13.7	125
974	5 14	13.5	82	1034	2 15	16.0	54	1094	5 5	14.0	79	1154	5 1	14.1	78
975	7 13	13.1	100	1035	11 28	14.4	132	1095	2 21	13.7	56	1155	1 7	14.6	41
976	9 12	13.8	115	1036	.	.	..	1096	1 11	13.4	43	1156	12 7	14.2	134
977	12 16	13.1	136	1037	.	.	..	1097	.	.	..	1157	11 17	14.3	129
978	12 21	13.5	138	1038	10 17	13.1	122	1098	.	.	..	1158	.	.	..
979	.	.	..	1039	.	.	..	1099	2 8	15.7	52	1159	7 30	14.1	104
980	4 7	11.8	72	1040	1 24	13.4	46	1100	7 21	13.8	102	1160	.	.	..
981	2 27	15.2	58	1041	5 10	13.8	81	1101	.	.	..	1161	.	.	..
982	1 3	14.3	40	1042	3 1	13.9	59	1102	4 1	13.5	71	1162	4 1	13.6	70
983	.	.	..	1043	5 15	13.4	83	1103	12 23	13.3	138	1163	1 14	13.9	44
984	.	.	..	1044	.	.	..	1104	4 6	16.6	72	1164	.	.	..
985	.	.	..	1045	1 19	15.0	45	1105	5 30	13.7	88	1165	7 5	12.6	98
986	3 13	14.6	63	1046	4 12	14.1	74	1106	8 25	14.7	111	1166	11 16	14.4	129
987	2 22	15.1	56	1047	7 9	14.0	99	1107	6 8	13.1	90	1167	3 19	13.8	65
988	3 17	15.8	65	1048	.	.	..	1108	2 11	15.8	53	1168	12 25	14.8	139
989	6 19	15.3	93	1049	10 6	13.4	120	1109	5 30	12.9	88	1169	6 14	15.8	92
990	5 26	15.9	87	1050	.	.	..	1110	3 8	14.7	62	1170	6 14	15.3	92
991	2 16	16.5	54	1051	6 15	13.5	93	1111	1 23	13.6	46	1171	11 3	12.0	126
992	7 19	14.6	101	1052	4 15	13.7	75	1112	3 12	13.9	63	1172	2 14	14.8	53
993	.	.	..	1053	.	.	..	1113	1 29	12.7	49	1173	3 4	15.1	60
994	3 12	13.6	63	1054	2 25	14.4	57	1114	4 12	12.9	74	1174	.	.	..
995	2 11	14.2	52	1055	5 4	13.1	79	1115	6 3	13.9	89	1175	9 30	14.2	118
996	9 4	14.7	113	1056	1 14	14.3	43	1116	.	.	..	1176	8 20	13.9	110
997	.	.	..	1057	2 7	14.9	51	1117	4 15	13.5	74	1177	8 20	13.4	110
998	.	.	..	1058	2 24	15.2	57	1118	2 5	14.2	51	1178	12 8	16.4	134
999	3 13	16.0	63	1059	10 20	14.3	123	1119	5 10	13.0	82	1179	.	.	..
1000	11 6	15.0	127	1060	1 8	15.9	41	1120	5 12	14.2	82	1180	4 22	14.2	76
1001	.	.	..	1061	7 19	15.0	101	1121	5 4	14.9	79	1181	9 25	13.2	117
1002	11 27	13.8	131	1062	.	.	..	1122	3 19	15.5	65	1182	.	.	..
1003	.	.	..	1063	.	.	..	1123	5 16	14.5	83	1183	.	.	..
1004	6 29	13.4	96	1064	11 22	14.0	130	1124	6 22	13.2	94	1184	6 11	13.4	91
1005	.	.	..	1065	3 20	16.0	66	1125	1 10	15.7	42	1185	10 31	13.2	125
1006	1 30	15.1	49	1066	3 20	15.9	66	1126	6 12	14.7	91	1186	.	.	..
1007	1 16	14.0	44	1067	.	.	..	1127	5 20	14.4	84	1187	.	.	..
1008	1 26	14.3	47	1068	12 23	13.2	138	1128	1 20	13.3	45	1188	.	.	..
1009	5 17	19.6	83	1069	10 26	13.7	124	1129	1 3	13.2	40	1189	.	.	..
1010	7 2	13.6	97	1070	4 3	15.1	71	1130	.	.	..	1190	2 20	14.0	55
1011	6 16	17.7	93	1071	1 31	13.0	49	1131	.	.	..	1191	6 25	13.7	95
1012	.	.	..	1072	6 2	15.0	88	1132	11 3	12.9	126	1192	9 2	14.9	113
1013	5 29	13.7	87	1073	.	.	..	1133	2 21	14.1	56	1193	.	.	..
1014	.	.	..	1074	1 4	12.7	40	1134	12 31	17.5	140	1194	8 17	13.7	108
1015	2 28	13.3	59	1075	10 26	13.5	124	1135	12 24	13.7	139	1195	.	.	..
1016	1 23	13.0	46	1076	1 27	13.4	48	1136	1 26	14.5	47	1196	2 16	13.8	54
1017	10 21	14.0	123	1077	4 8	15.7	73	1137	6 8	13.0	90	1197	9 5	13.9	113
1018	.	.	..	1078	.	.	..	1138	.	.	..	1198	3 26	18.3	68
1019	.	.	..	1079	3 7	14.1	61	1139	5 5	15.4	79	1199	10 1	13.6	119
1020	2 16	14.0	54	1080	.	.	..	1140	11 12	12.6	128	1200	9 26	14.2	117

## Opposition Dates

No Date Mg Pg					No Date Mg Pg					No Date Mg Pg					No Date Mg Pg				
1201	3	25	14.4	68	1261	10	29	14.6	124	1321	.	.	..	..	1381	.	.	..	..
1202	11	10	13.9	128	1262	.	.	..	..	1322	.	.	..	..	1382	.	.	..	..
1203	.	.	..	..	1263	6	11	12.9	91	1323	9	24	14.9	117	1383	1	23	15.2	46
1204	3	4	16.1	60	1264	2	21	13.2	56	1324	7	5	12.7	98	1384	9	10	13.9	114
1205	8	21	14.6	110	1265	8	24	13.2	110	1325	.	.	..	..	1385	1	16	13.5	44
1206	.	.	..	..	1266	4	15	13.3	74	1326	7	26	14.5	103	1386	.	.	..	..
1207	.	.	..	..	1267	12	12	15.0	136	1327	4	24	14.2	77	1387	1	16	15.9	44
1208	3	29	15.3	70	1268	7	20	13.7	102	1328	2	12	14.2	53	1388	.	.	..	..
1209	12	22	14.9	138	1269	11	20	13.5	129	1329	10	7	12.5	120	1389	2	11	14.0	52
1210	7	12	13.2	100	1270	.	.	..	..	1330	.	.	..	..	1390	8	24	13.0	111
1211	.	.	..	..	1271	8	12	14.0	107	1331	1	31	15.5	49	1391	.	.	..	..
1212	.	.	..	..	1272	1	19	15.7	45	1332	7	10	13.0	99	1392	.	.	..	..
1213	9	9	14.0	114	1273	10	10	14.2	121	1333	3	29	14.7	70	1393	3	9	13.9	62
1214	5	26	12.7	87	1274	3	16	13.4	64	1334	1	15	14.7	44	1394	4	17	13.8	75
1215	11	21	12.4	130	1275	2	26	14.2	58	1335	6	20	15.2	94	1395	6	19	14.8	93
1216	12	11	15.1	135	1276	8	5	14.4	106	1336	4	16	14.0	75	1396	12	6	14.5	134
1217	7	17	14.4	101	1277	9	3	13.1	113	1337	4	6	14.9	72	1397	.	.	..	..
1218	9	5	15.6	113	1278	3	8	15.4	62	1338	8	17	14.9	108	1398	8	18	15.0	109
1219	12	5	13.1	134	1279	2	25	15.0	58	1339	4	22	13.9	76	1399	.	.	..	..
1220	.	.	..	..	1280	12	11	13.8	135	1340	2	16	14.4	54	1400	11	23	15.1	130
1221	.	.	..	..	1281	.	.	..	..	1341	11	23	14.2	131	1401	2	1	14.1	49
1222	11	27	15.2	132	1282	2	21	15.7	56	1342	10	11	15.1	121	1402	.	.	..	..
1223	.	.	..	..	1283	6	20	14.9	94	1343	2	19	14.6	55	1403	1	25	15.8	47
1224	4	28	14.5	78	1284	.	.	..	..	1344	.	.	..	..	1404	8	7	14.9	106
1225	5	31	14.2	88	1285	4	26	13.3	77	1345	.	.	..	..	1405	.	.	..	..
1226	6	9	14.3	90	1286	3	22	14.1	67	1346	5	25	14.7	86	1406	2	27	15.8	59
1227	5	7	13.6	80	1287	5	9	14.0	81	1347	9	5	13.5	113	1407	2	18	15.8	55
1228	1	27	14.2	48	1288	6	24	14.7	95	1348	3	20	13.2	66	1408	12	17	14.1	137
1229	6	15	15.1	92	1289	7	3	13.2	97	1349	.	.	..	..	1409	6	8	13.6	90
1230	7	17	15.5	101	1290	6	13	14.4	92	1350	5	21	15.3	85	1410	.	.	..	..
1231	4	17	13.7	75	1291	3	29	13.8	69	1351	.	.	..	..	1411	1	7	14.0	41
1232	8	4	13.6	106	1292	1	2	13.1	40	1352	11	8	13.5	128	1412	2	27	13.8	59
1233	8	31	13.5	112	1293	.	.	..	..	1353	7	15	13.0	100	1413	.	.	..	..
1234	11	23	13.9	131	1294	.	.	..	..	1354	9	2	13.2	112	1414	5	24	15.3	86
1235	12	25	14.8	139	1295	2	9	14.1	52	1355	.	.	..	..	1415	3	3	13.5	60
1236	.	.	..	..	1296	7	22	14.7	102	1356	9	11	12.6	114	1416	.	.	..	..
1237	8	8	13.1	106	1297	8	10	14.5	107	1357	9	24	12.5	117	1417	4	5	15.0	72
1238	9	6	15.0	114	1298	5	22	14.1	85	1358	9	29	13.3	118	1418	12	3	13.8	133
1239	8	10	15.6	107	1299	.	.	..	..	1359	11	2	12.8	126	1419	.	.	..	..
1240	3	4	14.5	60	1300	.	.	..	..	1360	2	26	13.7	58	1420	2	5	14.7	51
1241	.	.	..	..	1301	.	.	..	..	1361	12	24	14.5	139	1421	4	3	14.2	71
1242	10	1	11.3	118	1302	.	.	..	..	1362	9	7	12.6	114	1422	.	.	..	..
1243	1	25	15.1	46	1303	8	22	13.7	110	1363	.	.	..	..	1423	.	.	..	..
1244	8	21	13.8	110	1304	10	30	13.8	125	1364	1	9	14.7	42	1424	12	27	14.8	139
1245	6	27	13.0	96	1305	1	11	13.7	43	1365	1	22	13.8	46	1425	9	23	15.9	116
1246	1	29	15.8	48	1306	8	22	13.3	110	1366	12	26	13.7	139	1426	11	20	14.4	129
1247	3	21	14.5	66	1307	11	8	13.0	127	1367	.	.	..	..	1427	11	5	13.3	127
1248	.	.	..	..	1308	7	4	14.1	98	1368	5	6	12.7	80	1428	10	17	12.7	122
1249	4	10	13.2	73	1309	7	12	14.6	100	1369	12	9	14.4	135	1429	1	10	15.4	42
1250	8	25	16.6	111	1310	3	30	13.5	70	1370	1	14	16.2	43	1430	.	.	..	..
1251	2	24	14.6	57	1311	.	.	..	..	1371	10	26	15.1	124	1431	.	.	..	..
1252	7	6	13.1	98	1312	3	19	16.7	65	1372	4	6	15.3	72	1432	3	22	15.5	67
1253	7	9	15.7	99	1313	.	.	..	..	1373	7	29	16.0	104	1433	.	.	..	..
1254	.	.	..	..	1314	10	27	13.7	124	1374	3	3	16.4	60	1434	5	17	13.4	84
1255	3	24	15.2	68	1315	.	.	..	..	1375	.	.	..	..	1435	6	7	17.0	90
1256	8	1	14.2	104	1316	5	15	16.7	83	1376	2	22	15.6	56	1436	12	15	13.6	136
1257	5	14	13.5	83	1317	12	21	12.3	138	1377	7	20	14.5	102	1437	7	2	14.3	97
1258	3	20	14.6	66	1318	.	.	..	..	1378	3	23	13.3	67	1438	5	29	15.5	87
1259	11	4	14.7	126	1319	11	22	14.6	130	1379	.	.	..	..	1439	.	.	..	..
1260	7	4	14.0	98	1320	.	.	..	..	1380	3	10	15.1	62	1440	6	22	15.9	95



# Opposition Dates

39

No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg	No	Date	Mg	Pg
1441	1 26	15.8	48	1472	4 24	16.9	77	1503	. .	..	..	1534	. .	..	..
1442	. .	..	..	1473	. .	..	..	1504	6 23	15.8	95	1535	1 7	17.4	41
1443	. .	..	..	1474	4 27	16.6	78	1505	1 31	13.9	49	1536	1 14	16.6	44
1444	11 8	15.1	127	1475	. .	..	..	1506	4 2	14.2	71	1537	. .	..	..
1445	10 25	13.6	123	1476	12 28	15.9	140	1507	. .	..	..	1538	7 11	15.3	99
1446	. .	..	..	1477	8 16	16.0	108	1508	9 21	16.9	116	1539	. .	..	..
1447	5 22	15.4	85	1478	7 20	16.5	102	1509	3 14	13.9	64	1540	10 6	15.6	120
1448	9 2	17.2	113	1479	3 14	15.2	63	1510	. .	..	..	1541	. .	..	..
1449	. .	..	..	1480	. .	..	..	1511	7 17	15.3	101	1542	11 13	15.0	128
1450	4 30	15.9	78	1481	. .	..	..	1512	4 16	15.0	75	1543	. .	..	..
1451	. .	..	..	1482	1 2	15.3	40	1513	6 29	15.2	96	1544	5 6	15.9	80
1452	11 10	14.9	128	1483	3 20	14.7	66	1514	. .	..	..	1545	. .	..	..
1453	12 23	15.5	138	1484	4 21	12.6	76	1515	5 22	16.1	85	1546	11 24	13.6	131
1454	3 9	14.5	62	1485	3 28	15.5	69	1516	6 2	13.0	88	1547	5 4	15.5	79
1455	5 24	14.0	86	1486	3 28	15.6	69	1517	4 1	13.7	71	1548	12 19	15.0	137
1456	3 23	15.0	67	1487	7 24	14.4	103	1518	6 1	16.6	88	1549	3 29	15.2	69
1457	11 23	14.9	131	1488	8 27	16.0	111	1519	4 4	17.6	71	1550	3 14	16.2	64
1458	. .	..	..	1489	9 30	16.1	118	1520	5 23	15.8	85	1551	10 22	15.0	123
1459	6 9	14.3	90	1490	7 11	12.5	100	1521	8 31	16.3	112	1552	. .	..	..
1460	4 15	16.8	74	1491	10 2	14.9	119	1522	3 21	15.8	66	1553	8 11	15.2	107
1461	11 2	13.1	126	1492	. .	..	..	1523	8 30	14.3	112	1554	3 20	15.3	66
1462	11 14	16.3	129	1493	. .	..	..	1524	2 14	16.7	54	1555	1 5	15.6	40
1463	10 8	14.0	120	1494	5 18	16.2	84	1525	5 12	17.6	82	1556	. .	..	..
1464	5 12	16.2	82	1495	11 10	16.3	128	1526	. .	..	..	1557	1 12	14.3	43
1465	. .	..	..	1496	3 28	16.2	69	1527	. .	..	..	1558	. .	..	..
1466	. .	..	..	1497	7 1	15.5	97	1528	. .	..	..	1559	8 25	15.9	111
1467	. .	..	..	1498	3 31	17.9	70	1529	3 26	16.6	68	1560	. .	..	..
1468	3 12	16.2	63	1499	11 25	15.7	131	1530	3 29	17.7	69	1561	3 14	14.2	64
1469	3 21	14.1	66	1500	5 6	17.5	80	1531	12 12	13.5	135	1562	7 20	13.9	102
1470	3 21	15.7	67	1501	. .	..	..	1532	5 24	15.7	86	1563	7 30	14.7	104
1471	10 3	14.8	119	1502	12 4	14.0	133	1533	10 16	15.5	122				

## OPPOSITION EPHEMERIDES

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.
832 Karin				1129 Neujmina			
	h m	° '	13 <sup>m</sup> 4		h m	° '	13 <sup>m</sup> 2
12 14	6 57.6	6.9 +22 17	6 77°	12 14	7 08.7	6.5 +20 51	15 50°
22	6 50.7	7.7 +22 23	6 0.452	22	7 02.2	7.4 +20 36	13 0.457
30	6 43.0	7.7 +22 29	6 -10'	30	6 54.8	7.7 +20 23	13 -3.5
1 7	6 35.3	7.2 +22 34	5 10 <sup>m</sup> 9	1 7	6 47.1	7.1 +20 10	13
15	6 28.1	6.2 +22 38	4 0.267	15	6 40.0	6.4 +19 58	12 0.275
23	6 21.9	+22 40	2 1*	23	6 33.6	+19 47	11 9*
513 Centesima				93 Minerva			
	h m	° '	12 <sup>m</sup> 0		h m	° '	11 <sup>m</sup> 6
12 14	7 00.3	6.1 +8 16	6 47°	12 14	7 13.2	7.5 +34 40	22 187°
22	6 54.2	6.7 +8 10	4 0.454	22	7 05.7	8.4 +35 02	17 0.497
30	6 47.5	6.9 +8 14	12 -0.8	30	6 57.3	8.7 +35 19	8 -9'
1 7	6 40.6	6.4 +8 26	20 9 <sup>m</sup> 3	1 7	6 48.6	8.5 +35 27	1 9 <sup>m</sup> 3
15	6 34.2	5.7 +8 46	25 0.276	15	6 40.1	7.7 +35 26	10 0.338
23	6 28.5	+9 11	2 2*	23	6 32.4	+35 16	1 1*
226 Weringia				982 Franklina			
	h m	° '	14 <sup>m</sup> 1		h m	° '	14 <sup>m</sup> 3
12 14	7 04.2	6.4 +9 04	18 172°	12 14	7 13.0	6.6 +28 43	1 169°
22	6 57.8	7.1 +9 22	26 0.514	22	7 06.4	7.3 +28 42	4 0.577
30	6 50.7	7.3 +9 48	32 +15'	30	6 59.1	7.4 +28 38	8 -4.4
1 7	6 43.4	7.1 +10 20	37 6 <sup>m</sup> 8	1 7	6 51.7	7.3 +28 30	11
15	6 36.3	6.4 +10 57	41 0.362	15	6 44.4	6.7 +28 19	15 0.446
23	6 29.9	+11 38	1 1*	23	6 37.7	+28 04	3
1292 Luce				1074 Beljawska			
	h m	° '	13 <sup>m</sup> 1		h m	° '	12 <sup>m</sup> 7
12 14	7 06.3	7.3 +22 21	3 316°	12 14	7 11.6	6.3 +23 34	13 33°
22	6 59.0	8.1 +22 24	2 0.389	22	7 05.3	7.2 +23 47	13 0.432
30	6 50.9	8.6 +22 26	2 -1.3	30	6 58.1	7.3 +24 00	10 -1.4
1 7	6 42.3	8.1 +22 28	0 0.167	1 7	6 50.8	7.2 +24 10	9
15	6 34.2	7.0 +22 28	1 0.167	15	6 43.6	6.1 +24 19	5 0.236
23	6 27.2	+22 27	13	23	6 37.5	+24 24	9
1482 Sebastiana				361 Bononia			
	h m	° '	15 <sup>m</sup> 3		h m	° '	12 <sup>m</sup> 1
12 14	7 06.3	6.7 +24 30	18 178°	12 14	7 16.3	6.1 +40 03	31 6°
22	6 59.6	7.5 +24 48	17 0.473	22	7 10.2	7.1 +40 34	23 0.492
30	6 52.1	7.7 +25 05	15 -0.5	30	7 03.1	7.6 +40 57	14 -0.9
1 7	6 44.4	7.5 +25 20	12	1 7	6 55.5	7.3 +41 11	1
15	6 36.9	6.6 +25 32	8 0.299	15	6 48.2	6.5 +41 12	10 0.334
23	6 30.3	+25 40	12*	23	6 41.7	+41 02	2
550 Senta				1555 Dejan			
	h m	° '	12 <sup>m</sup> 8		h m	° '	15 <sup>m</sup> 6
12 14	7 08.4	7.5 +20 51	11 132°	12 14	7 22.1	8.0 +28 27	7 68°
22	7 00.9	8.3 +20 40	11 0.480	22	7 14.1	9.0 +28 34	2 0.415
30	6 52.6	8.4 +20 29	10 -29'	30	7 05.1	9.2 +28 36	4 -2.4
1 7	6 44.2	8.0 +20 19	11 8 <sup>m</sup> 3	1 7	6 55.9	8.8 +28 32	10
15	6 36.2	7.0 +20 08	10 0.310	15	6 47.1	7.5 +28 22	15 0.210
23	6 29.2	+19 58	1 1*	23	6 39.6	+28 07	6

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.
363 Padua				173 Ino			
			11 <sup>m</sup> 7				10 <sup>m</sup> 8
12 14	h m	°		12 22	h m	°	
	7 21.1	6.8	+27 06 32		7 24.5	7.0	+6 02 31
	7 14.3	7.7	+27 38 29		7 17.5	7.5	+6 33 43
	7 06.6	8.3	+28 07 25	1 7	7 10.0	7.3	+7 16 52
1 7	6 58.3	8.1	+28 32 19		7 02.7	6.8	+8 08 57
	6 50.2	7.3	+28 51 13		6 55.9	5.6	+9 05 61
	6 42.9		+29 04		6 50.3		+10 06
			0.258				0.226*
			2				2
100 Hekate				1155 Aëna			
			12 <sup>m</sup> 6				14 <sup>m</sup> 6
12 14	h m	°		12 22	h m	°	
	7 22.0	5.7	+18 15 16		7 29.0	8.3	+31 07 35
	7 16.3	6.4	+18 31 18		7 20.7	9.2	+31 42 28
	7 09.9	6.8	+18 49 20	1 7	7 11.5	9.5	+32 10 19
1 7	7 03.1	6.6	+19 09 21		7 02.0	9.0	+32 29 11
	6 56.5	6.3	+19 30 19		6 53.0	7.7	+32 40 0
	6 50.2		+19 49		6 45.3		+32 40
			0.407				0.224*
			3*				1
713 Luscinia				1535 1939 RC			
			13 <sup>m</sup> 2				17 <sup>m</sup> 4
12 14	h m	°		12 14	h m	°	
	7 18.2	5.4	+10 12 9		7 25.0	5.7	+19 45 1
	7 12.8	5.9	+10 03 4		7 19.3	6.3	+19 46 2
	7 06.9	6.0	+9 59 1		7 13.0	6.7	+19 48 3
1 7	7 00.9	6.3	+10 00 7	1 7	7 06.3	6.7	+19 51 3
	6 54.6	5.7	+10 07 11		6 59.6	6.2	+19 54 3
	6 48.9		+10 18		6 53.4		+19 57
			0.419				0.445*
			2				12
830 Petropolitana				23 Thalia			
			11 <sup>m</sup> 8				9 <sup>m</sup> 0
12 14	h m	°		12 14	h m	°	
	7 25.2	6.0	+26 58 14		7 29.4	4.8	+30 40 80
	7 19.2	6.9	+27 12 11		7 24.6	7.0	+32 00 76
	7 12.3	7.4	+27 23 7		7 17.6	8.2	+33 16 68
1 7	7 04.9	7.3	+27 30 3	1 7	7 09.4	8.4	+34 24 56
	6 57.6	6.7	+27 33 1		7 01.0	7.7	+35 20 40
	6 50.9		+27 32		6 53.3		+36 00
			0.308				0.027*
			8				13
786 Bredichina				1411 Brauna			
			13 <sup>m</sup> 4				14 <sup>m</sup> 0
12 14	h m	°		12 14	h m	°	
	7 25.8	5.8	+26 07 40		7 32.6	6.2	+22 33 5
	7 20.0	6.7	+26 47 40		7 26.4	6.9	+22 28 5
	7 13.3	7.2	+27 27 38		7 19.5	7.6	+22 23 6
1 7	7 06.1	7.3	+28 05 33	1 7	7 11.9	7.6	+22 17 7
	6 58.8	7.0	+28 38 30		7 04.3	7.0	+22 10 8
	6 51.8		+29 08		6 57.3		+22 02
			0.386*				0.303
			1				11
547 Praxedis				1060 Magnolia			
			12 <sup>m</sup> 2				15 <sup>m</sup> 9
12 22	h m	°		12 22	h m	°	
	7 21.7	6.8	-4 48 8		7 30.7	8.2	+13 38 1
	7 14.9	7.3	-4 56 11		7 22.5	8.8	+13 39 7
	7 07.6	7.2	-4 45 28	1 7	7 13.7	8.9	+13 46 12
1 7	7 00.4	6.4	-4 17 45		7 04.8	8.3	+13 58 15
	6 54.0	5.2	-3 32 56		6 56.5	7.3	+14 13 17
	6 48.8		-2 36		6 49.2		+14 30
			0.206				0.227
			1				6

# OPPOSITION EPHEMERIDES

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
227 Philosophia 13 <sup>m</sup> 3				415 Palatia 9 <sup>m</sup> 9					
12 22	7 29.8	7.0	+30 44 10	254°	12 22	7 38.4	6.1	+14 57 51	24°
30	7 22.8	7.6	+30 54 5	0.536	30	7 32.3	7.0	+15 48 58	0.318
1 7	7 15.2	7.7	+30 59 0	-20	1 7 10	7 25.3	7.3	+16 46 62	+0.1
15	7 07.5	7.3	+30 59 7	7 <sup>m</sup> 3	15	7 18.0	6.5	+17 48 62	
23	7 00.2	6.6	+30 52 12	0.391*	23	7 11.5	5.3	+18 50 57	0.041
31	6 53.6		+30 40 1		31	7 06.2		+19 47 2	
853 Nansenia 13 <sup>m</sup> 9				1429 1937 NH 15 <sup>m</sup> 4					
12 22	7 31.5	7.2	+ 7 06 2	236°	12 22	7 44.7	8.7	+31 00 38	89°
30	7 24.3	8.1	+ 7 08 14	0.392	30	7 36.0	9.5	+31 38 32	0.449
1 7	7 16.2	8.5	+ 7 22 25	-1.5	1 7 10	7 26.5	9.6	+32 10 22	-16
15	7 07.7	7.9	+ 7 47 33		15	7 16.9	8.9	+32 32 12	10 <sup>m</sup> 6
23	6 59.8	6.9	+ 8 20 40	0.177	23	7 08.0	7.4	+32 44 3	0.263
31	6 52.9		+ 9 00 9		31	7 00.6		+32 47 7	
214 Aschera 12 <sup>m</sup> 0				1125 China 15 <sup>m</sup> 7					
12 22	7 34.7	7.5	+26 29 15	356°	12 22	7 40.0	6.3	+22 45 23	42°
30	7 27.2	8.4	+26 44 12	0.403	30	7 33.7	6.9	+23 08 23	0.447
1 7	7 18.8	8.6	+26 56 7	-2.6	1 7 10	7 26.8	7.3	+23 31 21	-1.6
15	7 10.2	8.1	+27 03 1		15	7 19.5	6.7	+23 52 18	
23	7 02.1	6.8	+27 04 4	0.190*	23	7 12.8	6.0	+24 10 14	0.260
31	6 55.3		+27 00 2		31	7 06.8		+24 24 9	
752 Sulamitis 12 <sup>m</sup> 6				393 Lampetia 12 <sup>m</sup> 6					
12 22	7 37.7	7.2	+24 37 45	0°	12 22	7 39.6	6.1	+ 2 13 6	161°
30	7 30.5	8.3	+25 22 43	0.360	30	7 33.5	6.6	+ 2 07 1	0.565
1 7	7 22.2	8.7	+26 05 39	-2	1 7 10	7 26.9	6.7	+ 2 08 9	-15
15	7 13.5	8.2	+26 44 32	18 <sup>m</sup> 3	15	7 20.2	6.6	+ 2 17 18	4 <sup>m</sup> 9
23	7 05.3	6.9	+27 16 24	0.116*	23	7 13.6	6.0	+ 2 35 24	0.437
31	6 58.4		+27 40 1		31	7 07.6		+ 2 59 1	
1364 Safara 14 <sup>m</sup> 7				534 Nassovia 12 <sup>m</sup> 6					
12 22	7 37.4	6.9	+32 07 41	180°	12 22	7 43.9	6.3	+22 18 25	37°
30	7 30.5	7.6	+32 48 35	0.508	30	7 37.6	7.3	+22 43 27	0.440
1 7	7 22.9	7.9	+33 23 28	0.0	1 7 11	7 30.3	7.6	+23 10 24	-1.1
15	7 15.0	7.5	+33 51 20		15	7 22.7	7.3	+23 34 22	
23	7 07.5	6.8	+34 11 11	0.353	23	7 15.4	6.5	+23 56 18	0.249
31	7 00.7		+34 22 3		31	7 08.9		+24 14 2	
251 Sophia 13 <sup>m</sup> 2				811 Nauheima 14 <sup>m</sup> 0					
12 22	7 34.7	5.9	+ 9 12 19	23°	12 22	7 45.0	6.2	+19 26 20	158°
30	7 28.8	6.6	+ 9 31 27	0.448	30	7 38.8	7.1	+19 46 21	0.492
1 7	7 22.2	6.7	+ 9 58 34	-0.1	1 7 11	7 31.7	7.2	+20 07 22	-13
15	7 15.5	6.3	+10 32 40		15	7 24.5	7.1	+20 29 21	8 <sup>m</sup> 7
23	7 09.2	5.5	+11 12 44	0.264	23	7 17.4	6.4	+20 50 19	0.326
31	7 03.7		+11 56 8		31	7 11.0		+21 09 7	

## OPPOSITION EPHEMERIDES

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1305 Pongola 13 <sup>m</sup> 7				283 Emma 12 <sup>m</sup> 0			
12 22	7 45.6	6.2 +23 34	21 264°	12 22	7 59.1	6.5 +23 55	5 96°
30	7 39.4	7.0 +23 55	21 0.485	30	7 52.6	7.2 +24 00	4 0.498
1 7	7 32.4	7.4 +24 16	19 -14	1 7	7 45.4	7.6 +24 04	2 -35
15	7 25.0	7.2 +24 35	16 9 <sup>m</sup> 4	15	7 37.8	7.5 +24 06	1 8 <sup>m</sup> 4
23	7 17.8	6.5 +24 51	12 0.317	23	7 30.3	6.9 +24 05	4 0.337
31	7 11.3	+25 03	1 1*	31	7 23.4	+24 01	1*
1096 Reunerta 13 <sup>m</sup> 4				1370 Hella 16 <sup>m</sup> 2			
12 22	7 50.3	7.2 +26 55	44 128°	12 22	8 02.6	8.0 +22 53	10 263°
30	7 43.1	8.2 +27 39	41 0.470	30	7 54.6	8.5 +23 03	12 0.352
1 7	7 34.9	8.5 +28 20	36 -0.2	1 7	7 46.1	9.5 +23 15	9 -2.2
15	7 26.4	8.2 +28 56	29	15	7 36.6	9.4 +23 24	6
23	7 18.2	7.5 +29 25	21 0.296	23	7 27.2	8.5 +23 30	2 0.213
31	7 10.7	+29 46	5*	31	7 18.7	+23 32	9
480 Hansa 11 <sup>m</sup> 4				1056 Azalea 14 <sup>m</sup> 3			
12 22	7 50.8	6.4 - 5 04	64 24°	12 22	7 55.5	3.6 +21 13	30 151°
30	7 44.4	7.5 - 6 08	47 0.404	30	7 51.9	5.2 +21 43	34 0.413
1 7	7 36.9	7.9 - 6 55	28 -66	1 7	7 46.7	6.3 +22 17	35 -7.0
15	7 29.0	7.7 - 7 23	9 11 <sup>m</sup> 7	15	7 40.4	6.8 +22 52	33
23	7 21.3	7.0 - 7 32	9 0.213	23	7 33.6	6.5 +23 25	30 0.214
31	7 14.3	- 7 23	1*	31	7 27.1	+23 55	6
1557 1942 AD 14 <sup>m</sup> 3				342 Endymion 12 <sup>m</sup> 1			
12 22	7 53.1	7.2 +34 58	23 101°	12 22	8 00.0	5.9 +10 28	20 14°
30	7 45.9	8.0 +35 21	15 0.492	30	7 54.1	7.1 +10 08	12 0.351
1 7	7 37.9	8.4 +35 36	7 -2.8	1 7	7 47.0	7.8 + 9 56	1 -58
15	7 29.5	8.0 +35 43	3 17 <sup>m</sup> 4	15	7 39.2	7.7 + 9 55	8
23	7 21.5	7.2 +35 40	13 0.332	23	7 31.5	6.9 +10 03	15 0.107
31	7 14.3	+35 27	8	31	7 24.6	+10 18	1*
968 Petunia 11 <sup>m</sup> 3				125 Liberatrix 11 <sup>m</sup> 6			
12 22	7 50.8	5.1 + 3 19	21 337°	12 22	7 59.8	5.9 +14 41	14 202°
30	7 45.7	6.8 + 2 58	8 0.400	30	7 53.9	6.7 +14 55	19 0.469
1 7	7 38.9	6.9 + 2 50	4 -2.8	1 7	7 47.2	7.4 +15 14	23 -1.9
15	7 32.0	6.9 + 2 54	18	15	7 39.8	7.3 +15 37	25
23	7 25.1	6.3 + 3 12	40 0.197	23	7 32.5	6.9 +16 02	26 0.294
31	7 18.8	+ 3 40	2	31	7 25.6	+16 28	2*
828 Lindemannia 14 <sup>m</sup> 0				948 Jucunda 13 <sup>m</sup> 1			
12 22	7 56.8	5.7 +22 17	17 151°	12 22	8 01.2	6.4 +33 11	26 325°
30	7 51.1	6.5 +22 34	16 0.523	30	7 54.8	7.5 +33 37	19 0.429
1 7	7 44.6	6.9 +22 50	17 -17	1 7	7 47.3	8.3 +33 56	11 -2.8
15	7 37.7	6.8 +23 07	13 7 <sup>m</sup> 7	15	7 39.0	8.3 +34 07	1
23	7 30.9	6.3 +23 20	11 0.373	23	7 30.7	7.5 +34 08	10 0.235
31	7 24.6	+23 31	1*	31	7 23.2	+33 58	4



## OPPOSITION EPHEMERIDES

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1536 1939 SE $16^m6$				105 Artemis $11^m6$			
12 22	h 8 05.3	m 7.6	+17 42	12 30	h 8 04.3	m 6.7	-11 34
30	7 57.7	9.0	+18 00	1 7	7 57.6	7.6	-11 43
1 7	7 48.7	9.5	+18 23	15 16	7 50.0	7.8	-11 31
15 14	7 39.2	9.3	+18 48	23 16	7 42.2	7.6	-10 56
23	7 29.9	8.2	+19 12	31	7 34.6	6.6	-10 02
31	7 21.7		+19 34	2 8	7 28.0		- 8 47
			12				2*
			87°				252°
			0.354,				0.407,
			-2.1				-1.4
			0.107				0.226*
			12				2
1163 Saga $13^m9$				1387 1935 QD $15^m9$			
12 22	h 8 00.5	m 5.3	+16 43	12 30	h 8 06.6	m 8.0	+11 29
30	7 55.2	6.1	+17 10	1 7	7 58.6	8.6	+11 43
1 7	7 49.1	6.4	+17 40	15 16	7 50.0	8.6	+12 04
15 14	7 42.7	6.6	+18 12	23 16	7 41.4	8.1	+12 31
23	7 36.1	6.1	+18 45	31	7 33.3	7.0	+13 00
31	7 30.0		+19 17	2 8	7 26.3		+13 31
			121°				134°
			0.525,				0.421,
			0.0				-2.4
			0.373				0.221
			3				5
1334 Lundmarka $14^m7$				1007 Pawlowia $14^m0$			
12 30	h 7 55.0	m 6.3	+14 33	12 30	h 8 06.4	m 7.3	+21 28
1 7	7 48.7	6.9	+15 07	1 7	7 59.1	8.0	+21 43
15 15	7 41.8	6.9	+15 46	15 16	7 51.1	8.0	+21 58
23	7 34.9	6.5	+16 26	23 16	7 43.1	7.5	+22 10
31	7 28.4	5.8	+17 07	31	7 35.6	6.3	+22 20
2 8	7 22.6		+17 47	2 8	7 29.3		+22 26
			216°				81°
			0.497,				0.430,
			+3				-35'
			8 <sup>m</sup> 2				11 <sup>m</sup> 9
			0.335*				0.233*
			1*				1*
737 Arequipa $12^m3$				731 Sorga $13^m2$			
12 30	h 7 58.6	m 6.7	+ 3 46	12 30	h 8 07.2	m 7.2	+34 01
1 7	7 51.9	7.3	+ 3 59	1 7	8 00.0	7.8	+34 38
15 15	7 44.6	7.2	+ 4 21	15 17	7 52.2	8.0	+35 08
23	7 37.4	6.8	+ 4 51	23 17	7 44.2	7.5	+35 30
31	7 30.6	6.0	+ 5 28	31	7 36.7	6.6	+35 42
2 8	7 24.6		+ 6 10	2 8	7 30.1		+35 44
			146°				131°
			0.498,				0.518,
			-1.2				-10'
			0.341*				8 <sup>m</sup> 6
			2*				0.367*
			1*				1*
406 Erna $13^m9$				869 Mellena $15^m2$			
12 22	h 8 05.5	m 6.3	+23 10	12 30	h 8 07.9	m 6.4	+12 34
30	7 59.2	7.2	+23 24	1 7	8 01.5	7.2	+12 56
1 7	7 52.0	7.7	+23 37	15 17	7 54.3	7.3	+13 25
15 15	7 44.3	7.6	+23 49	23 17	7 47.0	7.2	+13 57
23	7 36.7	7.0	+23 57	31	7 39.8	6.5	+14 32
31	7 29.7		+24 02	2 8	7 33.3		+15 07
			104°				235°
			0.494,				0.492,
			-27'				-9'
			8 <sup>m</sup> 5				7 <sup>m</sup> 9
			0.330*				0.327*
			1*				1*
1385 Gelria $13^m5$				798 Ruth $13^m1$			
12 30	h 8 03.1	m 6.9	+19 44	12 30	h 8 09.2	m 5.9	+ 6 57
1 7	7 56.2	7.6	+20 22	1 7	8 03.3	6.5	+ 6 58
15 16	7 48.6	7.7	+21 02	15 18	7 56.8	6.7	+ 7 07
23	7 40.9	7.0	+21 40	23 18	7 50.1	6.5	+ 7 23
31	7 33.9	6.0	+22 15	31	7 43.6	5.7	+ 7 46
2 8	7 27.9		+22 45	2 8	7 37.9		+ 8 12
			89°				220°
			0.442,				0.491,
			-1.0				-27'
			0.251*				8 <sup>m</sup> 2
			9*				0.329*
							1*

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.
<b>253 Mathilde</b>				<b>376 Geometria</b>			
	h	m	°		h	m	°
12 30	8 11.6	6.8	+11 12 19	12 30	8 23.7	7.7	+20 41 11
1 7	8 04.8	7.4	+11 31 24	1 7	8 16.0	8.8	+20 52 12
15 18	7 57.4	7.4	+11 55 28	15 19	8 07.2	9.4	+21 04 10
23	7 50.0	7.2	+12 23 32	23	7 57.8	9.2	+21 14 8
31	7 42.8	6.3	+12 55 31	31	7 48.6	8.3	+21 22 3
2 8	7 36.5		+13 26 1	2 8	7 40.3		+21 25 1
			14 <sup>m</sup> 3				12 <sup>m</sup> 4
			121°				236°
			0.494				0.408
			-14'				-49'
			7 <sup>m</sup> 6				12 <sup>m</sup> 1
			0.332*				0.197*
			1				1
<b>124 Alkeste</b>				<b>1128 Astrid</b>			
	h	m	°		h	m	°
12 30	8 11.7	6.6	+15 38 18	12 30	8 24.4	6.2	+20 35 24
1 7	8 05.1	7.5	+15 56 21	1 7	8 18.2	7.2	+20 59 25
15 18	7 57.6	7.8	+16 17 24	15 20	8 11.0	7.6	+21 24 24
23	7 49.8	7.4	+16 41 26	23	8 03.4	7.4	+21 48 22
31	7 42.4	6.6	+17 07 24	31	7 56.0	6.8	+22 10 17
2 8	7 35.8		+17 31 1	2 8	7 49.2		+22 27 13
			10 <sup>m</sup> 5				13 <sup>m</sup> 3
			238°				187°
			0.440				0.464
			-26'				-2.7
			10 <sup>m</sup> 7				0.286
			0.248*				13
			1				
<b>650 Amalasuntha</b>				<b>816 Juliana</b>			
	h	m	°		h	m	°
12 30	8 15.1	7.4	+15 34 16	12 30	8 25.5	5.3	+14 19 53
1 7	8 07.7	8.3	+15 50 21	1 7	8 20.2	6.2	+15 12 59
15 18	7 59.4	8.5	+16 11 24	15 20	8 14.0	6.8	+16 11 64
23	7 50.9	7.9	+16 35 24	23	8 07.2	6.7	+17 15 64
31	7 43.0	6.5	+16 59 23	31	8 00.5	6.2	+18 19 61
2 8	7 36.5		+17 22 1	2 8	7 54.3		+19 20 3
			14 <sup>m</sup> 4				13 <sup>m</sup> 2
			64°				338°
			0.368				0.436
			-41'				+0.5
			15 <sup>m</sup> 8				0.242
			0.131				3
			1				
<b>88 Thisbe</b>				<b>201 Penelope</b>			
	h	m	°		h	m	°
12 30	8 13.6	6.6	+17 39 9	12 30	8 26.8	6.2	+13 39 25
1 7	8 07.0	7.4	+17 48 11	1 7	8 20.6	7.0	+14 04 29
15 18	7 59.6	7.5	+17 59 12	15 21	8 13.6	7.4	+14 33 33
23	7 52.1	7.2	+18 11 11	23	8 06.2	7.3	+15 06 34
31	7 44.9	6.5	+18 22 10	31	7 58.9	6.6	+15 40 33
2 8	7 38.4		+18 32 1	2 8	7 52.3		+16 13 1
			11 <sup>m</sup> 7				12 <sup>m</sup> 6
			162°				131°
			0.505				0.482
			-29'				-15'
			7 <sup>m</sup> 4				8 <sup>m</sup> 4
			0.346*				0.314*
			1				1
<b>1272 Gefion</b>				<b>799 Gudula</b>			
	h	m	°		h	m	°
12 30	8 18.3	7.2	+25 33 13	12 30	8 30.6	6.1	+12 34 23
1 7	8 11.1	7.9	+25 46 10	1 7	8 24.5	7.1	+12 57 31
15 19	8 03.2	8.0	+25 56 6	15 21	8 17.4	7.7	+13 28 36
23	7 55.2	7.8	+26 02 1	23	8 09.7	7.6	+14 04 39
31	7 47.4	6.9	+26 03 4	31	8 02.1	6.9	+14 43 39
2 8	7 40.5		+25 59 4	2 8	7 55.2		+15 22 9
			15 <sup>m</sup> 7				12 <sup>m</sup> 8
			145°				82°
			0.498				0.404
			-7.3				-2.4
			0.336				0.191
			4				9
<b>1045 Michela</b>				<b>1025 Riema</b>			
	h	m	°		h	m	°
12 30	8 21.8	7.1	+19 18 21	12 30	8 32.1	5.7	-18 16 32
1 7	8 14.7	8.1	+19 39 24	1 7	8 26.4	7.3	-17 44 69
15 19	8 06.6	8.6	+20 03 24	15 22	8 19.1	8.2	-16 35 110
23	7 58.0	8.0	+20 27 21	23	8 10.9	8.3	-14 45 149
31	7 50.0	6.7	+20 48 16	31	8 02.6	7.5	-12 16 180
2 8	7 43.3		+21 04 6	2 8	7 55.1		-9 16 1
			15 <sup>m</sup> 0				13 <sup>m</sup> 7
			33°				333°
			0.315				0.282
			-2.6				+38'
			0.035				23 <sup>m</sup> 3
			6				0.019
							1

## OPPOSITION EPHEMERIDES

1946-7	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
835 Olivia				1016 Anitra			
	h	m	°		h	m	°
12 30	8 31.5	5.7	+20 09 14	1 7	8 41.4	8.9	+29 34 31
1 7	8 25.8	6.6	+20 23 15	15	8 32.5	9.9	+30 05 21
15 22	8 19.2	6.9	+20 38 15	23	8 22.6	9.8	+30 26 7
23	8 12.3	6.8	+20 53 14	31 23	8 12.8	8.7	+30 33 6
31	8 05.5	6.3	+21 07 10	2 8	8 04.1	6.8	+30 27 19
2 8	7 59.2		+21 17 10	16	7 57.3		+30 08 5
			14 <sup>m</sup> 0				13 <sup>m</sup> 0
			96°				49°
			0.516				0.314
			-31				-3.6
			7 <sup>m</sup> 6				
			0.363*				0.037
			1				5
829 Academia				1040 Klumpkea			
	h	m	°		h	m	°
12 30	8 35.5	7.4	+30 23 26	1 7	8 38.0	7.2	+ 9 15 32
1 7	8 28.1	8.7	+30 49 19	15	8 30.8	7.8	+ 8 43 26
15 22	8 19.4	9.1	+31 08 11	23	8 23.0	7.7	+ 8 17 18
23	8 10.3	9.0	+31 19 0	31 24	8 15.3	7.2	+ 7 59 12
31	8 01.3	7.9	+31 19 11	2 8	8 08.1	6.1	+ 7 47 7
2 8	7 53.4		+31 08 11	16	8 02.0		+ 7 40 3
			13 <sup>m</sup> 1				13 <sup>m</sup> 4
			75°				35°
			0.404				0.426
			-54				-7.9
			14 <sup>m</sup> 4				
			0.194*				0.229
			1				3
55 Pandora				842 Kerstin			
	h	m	°		h	m	°
12 30	8 36.1	6.9	+29 25 31	1 7	8 41.0	7.6	+37 57 25
1 7	8 29.2	8.0	+29 56 26	15	8 33.4	8.1	+38 22 15
15 22	8 21.2	8.4	+30 22 19	23	8 25.3	8.2	+38 37 5
23	8 12.8	8.4	+30 41 11	31 24	8 17.1	7.5	+38 42 7
31	8 04.4	7.4	+30 52 1	2 8	8 09.6	6.6	+38 35 18
2 8	7 57.0		+30 53 1	16	8 03.0		+38 17 3
			11 <sup>m</sup> 0				14 <sup>m</sup> 0
			90°				99°
			0.448				0.526
			-39				-4.4
			11 <sup>m</sup> 4				
			0.265*				0.382
			1				3
1365 1928 RK				1033 Simona			
	h	m	°		h	m	°
12 30	8 37.0	6.6	+13 28 1	1 7	8 39.1	5.8	+ 3 29 18
1 7	8 30.4	8.0	+13 27 6	15	8 33.3	6.4	+ 3 47 29
15 22	8 22.4	9.0	+13 33 11	23	8 26.9	6.5	+ 4 16 37
23	8 13.4	9.1	+13 44 15	31 24	8 20.4	6.2	+ 4 53 44
31	8 04.3	8.4	+13 59 19	2 8	8 14.2	5.3	+ 5 37 47
2 8	7 55.9		+14 18 19	16	8 08.9		+ 6 24 4
			13 <sup>m</sup> 8				14 <sup>m</sup> 0
			263°				65°
			0.366				0.460
			-3.8				-2.3
			0.127*				0.284
			4				4
1111 Reinmuthia				1243 Pamela			
	h	m	°		h	m	°
1 7	8 32.5	6.3	+17 32 30	1 7	8 39.7	5.9	+ 2 17 7
15	8 26.2	6.9	+18 02 31	15	8 33.8	6.5	+ 2 10 1
23 23	8 19.3	6.8	+18 33 31	23	8 27.3	6.6	+ 2 11 10
31	8 12.5	6.4	+19 04 29	31 25	8 20.7	6.3	+ 2 21 17
2 8	8 06.1	5.6	+19 33 25	2 8	8 14.4	5.6	+ 2 38 24
16	8 00.5		+19 58 25	16	8 08.8		+ 3 02 1
			13 <sup>m</sup> 6				15 <sup>m</sup> 1
			105°				184°
			0.491				0.510
			0.0				-40
			0.325				7 <sup>m</sup> 0
			3				0.358*
							1
1383 Limburgia				233 Asterope			
	h	m	°		h	m	°
1 7	8 33.3	6.5	+18 46 24	1 7	8 42.7	6.5	+ 6 43 9
15	8 26.8	7.0	+19 10 23	15	8 36.2	7.2	+ 6 52 18
23 23	8 19.8	7.0	+19 33 22	23	8 29.0	7.4	+ 7 10 24
31	8 12.8	6.4	+19 55 20	31 25	8 21.6	6.9	+ 7 34 31
2 8	8 06.4	5.6	+20 15 17	2 8	8 14.7	6.2	+ 8 05 33
16	8 00.8		+20 32 17	16	8 08.5		+ 8 38 1
			15 <sup>m</sup> 2				11 <sup>m</sup> 8
			93°				133°
			0.503				0.455
			-3.1				-36
			0.347*				9 <sup>m</sup> 2
			4				0.275*
							1

# OPPOSITION EPHEMERIDES

47

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1403 1936 QA 15 <sup>m</sup> 8				800 Kressmannia 14 <sup>m</sup> 0			
1	7	h 8 43.0 6.5 + 9 43 34	116°	1	7	h 8 50.2 8.2 +20 36 24	171°
	15	8 36.5 7.2 +10 17 39	0.503		15	8 42.0 9.2 +21 00 24	0.420
	23	8 29.3 7.1 +10 56 43	-1.3		23	8 32.8 9.4 +21 24 20	-4.7
	31	8 22.2 6.8 +11 39 45			31	8 23.4 9.2 +21 44 17	
2	8	8 15.4 6.0 +12 24 44	0.345	2	8	8 14.2 7.8 +22 01 10	0.217
	16	8 09.4 +13 08	9		16	8 06.4 +22 11	9
774 Armor 13 <sup>m</sup> 2				176 Iduna 12 <sup>m</sup> 3			
1	7	h 8 41.7 5.9 +12 07 11	217°	1	7	h 8 44.4 5.5 -12 52 1	86°
	15	8 35.8 6.4 +12 18 15	0.542		15	8 38.9 6.0 -12 51 17	0.510
	23	8 29.4 6.7 +12 33 18	-27		23	8 32.9 6.1 -12 34 32	-1.5
	31	8 22.7 6.4 +12 51 20	6 <sup>m</sup> 1		31	8 26.8 5.9 -12 02 46	
2	8	8 16.3 5.8 +13 11 20	0.399	2	8	8 20.9 5.3 -11 16 58	0.371
	16	8 10.5 +13 31	1*		16	8 15.6 -10 18	2*
680 Genoveva 14 <sup>m</sup> 3				672 Astarte 14 <sup>m</sup> 0			
1	7	h 8 46.4 7.1 +41 38 40	213°	1	7	h 8 49.9 8.0 +29 55 22	195°
	15	8 39.3 7.8 +42 18 31	0.598		15	8 41.9 8.9 +30 17 15	0.462
	23	8 31.5 8.0 +42 49 21	-11		23	8 33.0 9.1 +30 32 8	-47
	31	8 23.5 7.8 +43 10 10	5 <sup>m</sup> 9		31	8 23.9 8.7 +30 40 3	9 <sup>m</sup> 7
2	8	8 15.7 7.1 +43 20 2	0.483	2	8	8 15.2 7.7 +30 37 12	0.284
	16	8 08.6 +43 18	1*		16	8 07.5 +30 25	1*
865 Zubaida 12 <sup>m</sup> 8				1136 Mercedes 14 <sup>m</sup> 5			
1	7	h 8 43.1 5.0 - 3 40 27	6°	1	7	h 8 48.5 6.9 + 4 21 14	107°
	15	8 38.1 6.1 - 3 13 54	0.289		15	8 41.6 7.4 + 4 35 24	0.460
	23	8 32.0 6.5 - 2 19 77	-35		23	8 34.2 7.6 + 4 59 32	-3.2
	31	8 25.5 6.1 - 1 02 94	24 <sup>m</sup> 8		31	8 26.6 7.2 + 5 31 38	
2	8	8 19.4 4.8 + 0 32 107	9.998	2	8	8 19.4 6.4 + 6 09 42	0.283
	16	8 14.6 + 2 19	1*		16	8 13.0 + 6 51	5*
293 Brasilia 12 <sup>m</sup> 3				590 Tomyris 12 <sup>m</sup> 8			
1	7	h 8 47.3 7.1 +38 55 71	340°	1	7	h 8 47.6 5.9 +22 05 58	35°
	15	8 40.2 8.2 +40 06 59	0.412		15	8 41.7 6.8 +23 03 57	0.449
	23	8 32.0 8.6 +41 05 43	-12		23	8 34.9 7.0 +24 00 54	-1.0
	31	8 23.4 8.2 +41 48 25	16 <sup>m</sup> 6		31	8 27.9 6.7 +24 54 47	
2	8	8 15.2 7.0 +42 13 6	0.216	2	8	8 21.2 5.9 +25 41 39	0.262
	16	8 08.2 +42 19	1*		16	8 15.3 +26 20	3
695 Bella 11 <sup>m</sup> 7				1008 La Paz 14 <sup>m</sup> 3			
1	7	h 8 47.9 7.5 + 7 58 15	120°	1	7	h 8 49.4 6.8 +31 06 33	74°
	15	8 40.4 8.2 + 7 43 6	0.444		15	8 42.6 7.6 +31 39 25	0.483
	23	8 32.2 8.3 + 7 37 0	-63		23	8 35.0 7.7 +32 04 17	-3.4
	31	8 23.9 8.0 + 7 37 6	9 <sup>m</sup> 1		31	8 27.3 7.3 +32 21 8	
2	8	8 15.9 7.0 + 7 43 9	0.258	2	8	8 20.0 6.5 +32 29 2	0.317
	16	8 08.9 + 7 52	1*		16	8 13.5 +32 27	8

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1441 Bolyai 15 <sup>m</sup> 8				273 Atropos 12 <sup>m</sup> 4			
1	7	h 8 50.0 7.1 + 1 20 12	95°	1	7	h 8 52.9 6.1 - 0 31 41	219°
	15	8 42.9 7.7 + 1 08 1	0.450		15	8 46.8 7.1 + 0 10 57	0.435
	23	8 35.2 7.9 + 1 07 9	-52'		23	8 39.7 7.6 + 1 07 70	+6
	31 <sup>26</sup>	8 27.3 7.5 + 1 16 19	8 <sup>m</sup> 8		31 <sup>27</sup>	8 32.1 7.4 + 2 17 80	10 <sup>m</sup> 0
2	8	8 19.8 6.6 + 1 35 26	0.271*	2	8	8 24.7 6.8 + 3 37 87	0.249*
	16	8 13.2 + 2 01	1*		16	8 17.9 + 5 04	1*
237 Coelestina 13 <sup>m</sup> 2				512 Taurinensis 13 <sup>m</sup> 3			
1	7	h 8 49.3 6.5 +26 27 52	206°	1	7	h 9 01.9 7.8 +20 35 66	108°
	15	8 42.8 7.5 +27 19 49	0.468		15	8 54.1 9.0 +21 41 66	0.393
	23	8 35.3 7.7 +28 08 44	-12'		23	8 45.1 9.4 +22 47 61	-1.2
	31 <sup>26</sup>	8 27.6 7.5 +28 52 34	10 <sup>m</sup> 2		31 <sup>29</sup>	8 35.7 8.9 +23 48 52	
2	8	8 20.1 6.7 +29 26 25	0.293*	2	8	8 26.8 7.9 +24 40 42	0.173
	16	8 13.4 +29 51	1*		16	8 18.9 +25 22	6
1076 Viola 13 <sup>m</sup> 4				780 Armenia 13 <sup>m</sup> 0			
1	7	h 8 50.9 6.3 +15 11 36	32°	1	7	h 8 56.9 5.1 + 7 55 46	123°
	15	8 44.6 7.5 +15 47 43	0.339		15	8 51.8 5.9 + 8 41 53	0.518
	23	8 37.1 7.8 +16 30 44	-50'		23	8 45.9 6.1 + 9 34 58	+6
	31 <sup>27</sup>	8 29.3 7.3 +17 14 43	19 <sup>m</sup> 3		31 <sup>29</sup>	8 39.8 6.2 +10 32 61	7 <sup>m</sup> 4
2	8	8 22.0 6.2 +17 57 38	0.080*	2	8	8 33.6 5.6 +11 33 62	0.366*
	16	8 15.8 +18 35	1*		16	8 28.0 +12 35	1*
90 Antiope 12 <sup>m</sup> 5				574 Reginhild 13 <sup>m</sup> 5			
1	7	h 8 50.2 5.8 +20 11 27	180°	1	7	h 9 08.0 8.4 +23 34 15	51°
	15	8 44.4 6.3 +20 38 26	0.565		15	8 59.6 9.7 +23 49 11	0.300
	23	8 38.1 6.5 +21 04 26	-18'		23	8 49.9 10.1 +24 00 5	-111
	31 <sup>27</sup>	8 31.6 6.4 +21 30 23	5 <sup>m</sup> 9		31 <sup>29</sup>	8 39.8 9.4 +24 05 3	23 <sup>m</sup> 6
2	8	8 25.2 5.8 +21 53 19	0.429*	2	8	8 30.4 7.7 +24 02 13	0.006
	16	8 19.4 +22 12	1*		16	8 22.7 +23 49	1
265 Anna 14 <sup>m</sup> 0				1246 Chaka 15 <sup>m</sup> 8			
1	7	h 9 04.1 11.7 +44 29 13	283°	1	7	h 9 05.2 7.2 +10 17 5	123°
	15	8 52.4 13.4 +44 42 8	0.390		15	8 58.0 7.8 +10 12 1	0.504
	23	8 39.0 14.2 +44 34 31	-92'		23	8 50.2 8.1 +10 11 3	-8.6
	31 <sup>27</sup>	8 24.8 13.4 +44 03 56	14 <sup>m</sup> 5		31 <sup>29</sup>	8 42.1 7.9 +10 14 7	
2	8	8 11.4 11.8 +43 07 78	0.184*	2	8	8 34.2 7.4 +10 21 8	0.345*
	16	7 59.6 +41 49	1*		16	8 26.8 +10 29	5*
1228 Scabiosa 14 <sup>m</sup> 2				607 Jenny 12 <sup>m</sup> 6			
1	7	h 8 53.2 6.4 +18 11 16	333°	1	7	h 9 03.5 6.1 +11 45 7	284°
	15	8 46.8 7.3 +18 27 18	0.428		15	8 57.4 7.0 +11 38 1	0.450
	23	8 39.5 7.7 +18 45 18	-4.5		23	8 50.4 7.6 +11 37 2	-6.7
	31 <sup>27</sup>	8 31.8 7.4 +19 03 15			31 <sup>29</sup>	8 42.8 7.5 +11 39 5	
2	8	8 24.4 6.6 +19 18 13	0.230*	2	8	8 35.3 7.0 +11 44 8	0.265
	16	8 17.8 +19 31	5*		16	8 28.3 +11 52	2



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
127 Johanna				24 Themis			
	h	m	°		h	m	°
1 7	9 04.7	6.5	+30 11	1 15	9 02.5	6.2	+18 11
15	8 58.2	7.7	+30 53	23	8 56.3	6.7	+18 38
23	8 50.5	8.3	+31 30	31	8 49.6	6.8	+19 05
31 <sup>29</sup>	8 42.2	8.1	+31 57	2 8 <sup>31</sup>	8 42.8	6.3	+19 31
2 8	8 34.1	7.3	+32 13	16	8 36.5	5.2	+19 53
16	8 26.8		+32 16	24	8 31.3		+20 10
			10 <sup>m</sup> 2				10 <sup>m</sup> 1
			2°				351°
			0.411				0.437
			-3.7				-43
			0.207*				11 <sup>m</sup> 8
			2*				0.243*
							1
1113 Katja				1331 Solvejg			
	h	m	°		h	m	°
1 7	9 07.8	6.7	+24 34	1 15	9 02.0	5.9	+17 24
15	9 01.1	7.8	+24 35	23	8 56.1	6.3	+17 53
23	8 53.3	8.1	+24 34	31	8 49.8	6.4	+18 23
31 <sup>29</sup>	8 45.2	8.0	+24 28	2 8 <sup>31</sup>	8 43.4	6.0	+18 53
2 8	8 37.2	7.2	+24 16	16	8 37.4	5.3	+19 19
16	8 30.0		+23 58	24	8 32.1		+19 42
			12 <sup>m</sup> 7				15 <sup>m</sup> 5
			36°				187°
			0.442				0.566
			-5.2				-17
			0.252				5 <sup>m</sup> 6
			4				0.430*
							1
765 Mattiaca				1505 1939 HH			
	h	m	°		h	m	°
1 7	9 04.0	7.9	+21 09	1 15	9 07.4	6.7	- 3 45
15	8 56.1	9.0	+21 24	23	9 00.7	7.4	- 4 04
23	8 47.1	9.2	+21 39	31	8 53.3	7.6	- 4 08
31 <sup>30</sup>	8 37.9	8.7	+21 50	2 8 <sup>31</sup>	8 45.7	7.2	- 3 58
2 8	8 29.2	7.3	+21 56	16	8 38.5	6.5	- 3 36
16	8 21.9		+21 56	24	8 32.0		- 3 03
			14 <sup>m</sup> 6				13 <sup>m</sup> 9
			57°				281°
			0.367				0.421
			-4.6				-7.0
			0.129				0.229*
			6				10*
1006 Lagrangea				116 Sirona			
	h	m	°		h	m	°
1 7	9 06.1	6.8	+14 56	1 15	9 07.8	6.5	+21 52
15	8 59.3	7.4	+15 00	23	9 01.3	7.3	+22 32
23	8 51.9	7.7	+15 06	31	8 54.0	7.6	+23 10
31 <sup>30</sup>	8 44.2	7.4	+15 14	2 8 <sup>31</sup>	8 46.4	7.0	+23 43
2 8	8 36.8	6.8	+15 22	16	8 39.4	5.6	+24 09
16	8 30.0		+15 30	24	8 33.8		+24 25
			15 <sup>m</sup> 1				10 <sup>m</sup> 0
			70°				340°
			0.498				0.382
			-7.2				-3.4
			0.336				0.155*
			9				2*
75 Eurydike				1071 Brita			
	h	m	°		h	m	°
1 7	9 07.9	6.7	+22 28	1 15	9 08.6	7.0	+24 59
15	9 01.2	7.4	+22 57	23	9 01.6	7.6	+25 39
23	8 53.8	7.9	+23 25	31	8 54.0	7.6	+26 15
31 <sup>30</sup>	8 45.9	7.7	+23 50	2 8 <sup>31</sup>	8 46.4	7.0	+26 44
2 8	8 38.2	7.2	+24 11	16	8 39.4	5.8	+27 03
16	8 31.0		+24 26	24	8 33.6		+27 12
			12 <sup>m</sup> 8				13 <sup>m</sup> 0
			131°				41°
			0.519				0.412
			-31				-3.5
			6 <sup>m</sup> 6				0.205
			0.367*				2
			1*				
539 Pamina				1401 Lavonne			
	h	m	°		h	m	°
1 7	9 10.1	6.3	+11 00	1 15	9 10.9	8.1	+10 14
15	9 03.8	7.2	+11 07	23	9 02.8	8.7	+10 26
23	8 56.6	7.6	+11 20	31	8 54.1	8.7	+10 43
31 <sup>30</sup>	8 49.0	7.5	+11 36	2 8 <sup>1</sup>	8 45.4	8.1	+11 04
2 8	8 41.5	6.9	+11 56	16	8 37.3	7.0	+11 27
16	8 34.6		+12 16	24	8 30.3		+11 49
			13 <sup>m</sup> 5				14 <sup>m</sup> 1
			98°				140°
			0.467				0.428
			-5.7				-5.6
			0.291				0.230
			2				13

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
497 Iva				688 Melanie			
	h m	° '	14 <sup>m</sup> 0		h m	° '	14 <sup>m</sup> 2
1 15	9 12.5	7.3 +22 36	89°	1 15	9 18.0	6.0 + 6 04	187°
23	9 05.2	7.9 +23 05	0.490	23	9 12.0	6.5 + 6 37	0.487
31	8 57.3	7.8 +23 32	-4.8	31	9 05.5	6.8 + 7 18	-18'
2 8	8 49.5	7.2 +23 54	0.325	2 8	8 58.7	6.6 + 8 05	8 <sup>m</sup> 0
16	8 42.3	6.2 +24 10	2	16	8 52.1	5.9 + 8 55	0.322*
24	8 36.1	+24 18		24	8 46.2	+ 9 46	1
30 Urania				557 Violetta			
	h m	° '	10 <sup>m</sup> 0		h m	° '	13 <sup>m</sup> 1
1 15	9 16.7	7.7 +15 56	84°	1 15	9 21.4	6.7 +14 24	6°
23	9 09.0	8.5 +16 22	0.375	23	9 14.7	7.8 +14 41	0.341
31	9 00.5	8.6 +16 50	-4.4	31	9 06.9	8.1 +15 03	-85'
2 8	8 51.9	7.9 +17 17	0.143	2 8	8 58.8	7.7 +15 26	18 <sup>m</sup> 2
16	8 44.0	6.7 +17 42	2*	16	8 51.1	6.5 +15 47	0.083*
24	8 37.3	+18 00		24	8 44.6	+16 05	1
721 Tabora				168 Sibylla			
	h m	° '	14 <sup>m</sup> 0		h m	° '	11 <sup>m</sup> 6
1 15	9 13.2	5.9 +28 03	83°	1 15	9 18.0	5.2 + 9 19	85°
23	9 07.3	6.5 +28 35	0.550	23	9 12.8	5.8 + 9 39	0.528
31	9 00.8	6.5 +29 03	-4.1	31	9 07.0	6.0 +10 04	-3.8
2 8	8 54.3	6.1 +29 24	0.411	2 8	9 01.0	5.8 +10 40	0.379*
16	8 48.2	5.5 +29 39	2	16	8 55.2	5.2 +11 30	
24	8 42.7	+29 45		24	8 50.0	+12 34	
882 Swetlana				498 Tokio			
	h m	° '	14 <sup>m</sup> 4		h m	° '	12 <sup>m</sup> 3
1 15	9 14.0	6.2 + 9 08	84°	1 15	9 24.5	6.6 +22 48	144°
23	9 07.8	6.6 + 9 23	0.515	23	9 17.9	7.3 +23 40	0.500
31	9 01.2	6.8 + 9 43	-5.2	31	9 10.6	7.5 +24 31	-16'
2 8	8 54.4	6.3 +10 06	0.361	2 8	9 03.1	7.3 +25 16	7 <sup>m</sup> 9
16	8 48.1	5.6 +10 31	4	16	8 55.8	6.6 +25 54	0.339*
24	8 42.5	+10 55		24	8 49.2	+26 23	1
1150 Achaia				395 Delia			
	h m	° '	16 <sup>m</sup> 0		h m	° '	13 <sup>m</sup> 3
1 15	9 20.0	7.8 +11 44	135°	1 15	9 23.7	6.0 +11 20	232°
23	9 12.2	8.6 +12 17	0.406	23	9 17.7	6.8 +11 38	0.469
31	9 03.6	8.8 +12 55	-3.9	31	9 10.9	7.2 +12 01	-43'
2 8	8 54.8	8.2 +13 35	0.194	2 8	9 03.7	7.0 +12 28	8 <sup>m</sup> 8
16	8 46.6	7.2 +14 15	6	16	8 56.7	6.3 +12 56	0.293*
24	8 39.4	+14 51		24	8 50.4	+13 22	1
98 Ianthe				691 Lehigh			
	h m	° '	11 <sup>m</sup> 6		h m	° '	13 <sup>m</sup> 0
1 15	9 23.0	8.8 +37 45	345°	1 15	9 24.0	6.2 +28 00	90°
23	9 14.2	10.0 +37 56	0.345	23	9 17.8	6.9 +29 01	0.486
31	9 04.2	10.3 +37 52	-110'	31	9 10.9	7.2 +29 57	-1.7
2 8	8 53.9	9.5 +37 26	20 <sup>m</sup> 6	2 8	9 03.7	6.9 +30 44	0.322
16	8 44.4	7.8 +36 41	1*	16	8 56.8	6.2 +31 20	3
24	8 36.6	+35 38		24	8 50.6	+31 45	

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
34 Circe 10 <sup>m</sup> 9				508 Princetonia 12 <sup>m</sup> 4					
1 15	9 23.4	5.6	+ 7 42 26	347°	1 15	9 31.5	6.3	+34 22 46	202°
23	9 17.8	6.5	+ 8 08 38	0.382	23	9 25.2	7.1	+35 08 38	0.509
31	9 11.3	7.0	+ 8 46 43	-51	31	9 18.1	7.6	+35 46 28	-3.8
2 8	9 04.3	6.7	+ 9 29 48	14 <sup>m</sup> 7	2 8	9 10.5	7.3	+36 14 16	
16	8 57.6	6.0	+10 17 48	0.157*	16	9 03.2	6.7	+36 30 4	0.357
24	8 51.6		+11 05	1	24	8 56.5		+36 34	2
755 Quintilla 13 <sup>m</sup> 2				1420 Radcliffe 14 <sup>m</sup> 7					
1 15	9 22.8	5.4	+11 56 26	287°	1 15	9 33.1	5.9	+10 25 18	163°
23	9 17.4	6.0	+12 22 30	0.493	23	9 27.2	6.7	+10 43 24	0.470
31	9 11.4	6.5	+12 52 34	-30	31	9 20.5	7.2	+11 07 27	-5.2
2 8	9 04.9	6.3	+13 26 33	8 <sup>m</sup> 3	2 8	9 13.3	7.0	+11 34 28	
16	8 58.6	5.8	+13 59 33	0.328*	16	9 06.3	6.5	+12 02 29	0.294*
24	8 52.8		+14 32	1	24	8 59.8		+12 31	5
59 Elpis 11 <sup>m</sup> 2				198 Ampella 11 <sup>m</sup> 9					
1 15	9 24.7	5.9	+ 6 45 35	104°	1 15	9 35.5	6.8	+ 4 09 4	125°
23	9 18.8	6.6	+ 7 20 45	0.450	23	9 28.7	7.6	+ 4 13 13	0.454
31	9 12.2	6.9	+ 8 05 50	-24	31	9 21.1	8.0	+ 4 26 21	-52
2 8	9 05.3	6.6	+ 8 55 52	9 <sup>m</sup> 9	2 8	9 13.1	7.9	+ 4 47 26	8 <sup>m</sup> 4
16	8 58.7	6.0	+ 9 47 53	0.267*	16	9 05.2	7.1	+ 5 13 30	0.274*
24	8 52.7		+10 40	1	24	8 58.1		+ 5 43	1
528 Rezia 12 <sup>m</sup> 3				886 Washingtonia 14 <sup>m</sup> 2					
1 15	9 26.1	5.9	+33 10 44	25°	1 15	9 35.8	6.6	+36 23 52	108°
23	9 20.2	6.7	+33 54 38	0.522	23	9 29.2	7.2	+37 15 43	0.558
31	9 13.5	7.1	+34 32 28	-3.4	31	9 22.0	7.6	+37 58 33	-19
2 8	9 06.4	6.8	+35 00 18	0.376	2 8	9 14.4	7.4	+38 31 21	6 <sup>m</sup> 9
16	8 59.6	6.1	+35 18 6	2	16	9 07.0	6.8	+38 52 9	0.429*
24	8 53.5		+35 24		24	9 00.2		+39 01	1
716 Berkeley 13 <sup>m</sup> 2				1057 Wanda 14 <sup>m</sup> 9					
1 15	9 27.0	5.3	+11 17 45	308°	1 15	9 36.3	5.9	+10 09 20	103°
23	9 21.7	6.3	+12 02 53	0.426	23	9 30.4	6.6	+10 29 26	0.504
31	9 15.4	6.7	+12 55 56	-2.3	31	9 23.8	7.0	+10 55 28	-36
2 8	9 08.7	6.6	+13 51 57	0.227	2 8	9 16.8	6.8	+11 23 30	7 <sup>m</sup> 0
16	9 02.1	6.1	+14 48 53	2	16	9 10.0	6.3	+11 53 28	0.346*
24	8 56.0		+15 41		24	9 03.7		+12 21	1
1118 Hanskya 14 <sup>m</sup> 2				970 Primula 14 <sup>m</sup> 5					
1 15	9 29.1	6.2	+17 38 6	176°	1 15	9 40.8	7.2	+14 01 15	61°
23	9 22.9	6.8	+17 44 7	0.533	23	9 33.6	8.2	+14 16 19	0.375
31	9 16.1	7.1	+17 51 6	-52	31	9 25.4	8.7	+14 35 20	-83
2 8	9 09.0	6.9	+17 57 4	6 <sup>m</sup> 1	2 8	9 16.7	8.3	+14 55 19	14 <sup>m</sup> 1
16	9 02.1	6.4	+18 01 0	0.386*	16	9 08.4	7.2	+15 14 15	0.143
24	8 55.7		+18 01	1	24	9 01.2		+15 29	1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
37 Fides				995 Sternberga			
			9 <sup>m</sup> 9				14 <sup>m</sup> 2
1 15	9 40.2	6.3 +18 31	51°	1 23	9 48.7	6.1 - 6 09	156°
23	9 33.9	7.5 +19 01	0.379	31	9 42.6	6.7 - 5 56	0.481
31	9 26.4	8.0 +19 32	-73'	2 8	9 35.9	6.9 - 4 30	-33'
2 8	9 18.4	7.7 +20 01	15 <sup>m</sup> 0	16	9 29.0	6.6 - 4 53	7 <sup>m</sup> 7
16	9 10.7	6.9 +20 24	0.151	24	9 22.4	6.0 - 4 05	0.319
24	9 03.8	+20 40	1*	3 4	9 16.4	- 3 12	1*
1099 Figneria				744 Aguntina			
			15 <sup>m</sup> 7				13 <sup>m</sup> 2
1 23	9 40.5	7.0 +30 07	103°	1 23	9 48.0	5.1 +12 07	329°
31	9 33.5	7.3 +30 39	0.554	31	9 42.9	5.8 +12 53	0.465
2 8	9 26.2	7.3 +31 04	-5.8	2 8	9 37.1	6.1 +13 43	-27'
16	9 18.9	6.8 +31 21	0.419	16	9 31.0	5.9 +14 34	10 <sup>m</sup> 1
24	9 12.1	5.9 +31 28	3	24	9 25.1	5.2 +15 23	0.285
3 4	9 06.2	+31 25	3	3 4	9 19.9	+16 08	1*
638 Moira				332 Siri			
			13 <sup>m</sup> 4				13 <sup>m</sup> 0
1 23	9 39.8	6.4 +20 21	285°	1 23	9 51.4	6.3 +17 16	172°
31	9 33.4	7.1 +21 18	0.428	31	9 45.1	6.9 +17 50	0.480
2 8	9 26.3	7.4 +22 14	-2.7	2 8	9 38.2	7.3 +18 25	-42'
16	9 18.9	7.0 +23 05	0.232	16	9 30.9	6.9 +18 56	8 <sup>m</sup> 5
24	9 11.9	6.0 +23 48	2	24	9 24.0	6.2 +19 24	0.309
3 4	9 05.9	+24 22	2	3 4	9 17.8	+19 45	1*
1295 Deflotte				1389 Onnie			
			14 <sup>m</sup> 1				14 <sup>m</sup> 0
1 23	9 39.8	5.5 +10 35	29°	1 23	9 51.2	5.7 +11 02	8°
31	9 34.3	6.0 +11 04	0.468	31	9 45.5	6.5 +11 34	0.449
2 8	9 28.3	6.1 +11 37	-4.4	2 8	9 39.0	6.8 +12 11	-44'
16	9 22.2	5.7 +12 12	0.291	16	9 32.2	6.5 +12 50	10 <sup>m</sup> 2
24	9 16.5	4.8 +12 46	3	24	9 25.7	5.8 +13 28	0.263
3 4	9 11.7	+13 17	3	3 4	9 19.9	+14 02	1*
519 Sylvania				84 Klio			
			12 <sup>m</sup> 8				12 <sup>m</sup> 5
1 23	9 46.6	7.1 +30 04	138°	1 23	9 55.4	7.8 +15 18	149°
31	9 39.5	7.7 +30 47	0.506	31	9 47.6	8.4 +15 39	0.457
2 8	9 31.8	7.8 +31 23	-4.4	2 8	9 39.2	8.7 +16 00	-60'
16	9 24.0	7.3 +31 49	0.354	16	9 30.5	8.3 +16 20	8 <sup>m</sup> 1
24	9 16.7	6.5 +32 03	2	24	9 22.2	7.4 +16 37	0.275
3 4	9 10.2	+32 06	2	3 4	9 14.8	+16 47	1*
473 Nolli				204 Kallisto			
			13 <sup>m</sup> 4				12 <sup>m</sup> 2
1 23	9 54.0	9.6 +28 29	75°	1 23	9 51.8	5.8 + 1 07	265°
31	9 44.4	10.1 +28 23	0.473	31	9 46.0	6.6 + 1 29	0.446
2 8	9 34.3	10.0 +28 08	-94'	2 8	9 39.4	7.0 + 2 02	-40'
16	9 24.3	9.2 +27 43	7 <sup>m</sup> 2	16	9 32.4	6.8 + 2 45	9 <sup>m</sup> 6
24	9 15.1	7.9 +27 10	0.301	24	9 25.6	6.2 + 3 34	0.262
3 4	9 07.2	+26 28	1	3 4	9 19.4	+ 4 26	1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1108 Demeter 15 <sup>m</sup> 8				1085 Amaryllis 13 <sup>m</sup> 9			
1 23	9 53.6	6.4 -23 43	209°	1 23	9 58.4	5.0 +12 20	230°
31	9 47.2	7.3 -24 03	0.476	31	9 53.4	5.7 +13 00	0.521
2 8	9 39.9	7.7 -24 02	-4' 9	2 8	9 47.7	6.0 +13 43	-23'
16	9 32.2	7.6 -23 42	40	16	9 41.7	6.0 +14 27	7 <sup>m</sup> 3
24	9 24.6	7.1 -23 02	58	24	9 35.7	5.4 +15 09	0.369
3 4	9 17.5	-22 04	6*	3 4	9 30.3	+15 48	1*
844 Leontina 13 <sup>m</sup> 3				219 Thusnelda 12 <sup>m</sup> 5			
1 23	9 52.5	6.0 +19 44	163°	1 23	10 02.6	6.2 - 2 19	157°
31	9 46.5	6.5 +20 07	0.543	31	9 56.4	7.0 - 1 52	0.455
2 8	9 40.0	6.8 +20 28	-42'	2 8	9 9.4	7.5 - 1 13	-30'
16	9 33.2	6.5 +20 46	13	16	9 41.9	7.3 - 0 23	8 <sup>m</sup> 5
24	9 26.7	5.9 +20 59	8	24	9 34.6	6.6 + 0 35	0.277
3 4	9 20.8	+21 07	1*	3 4	9 28.0	+ 1 37	1*
1328 Devota 14 <sup>m</sup> 2				397 Vienna 14 <sup>m</sup> 7			
1 23	9 55.4	4.9 + 4 38	94°	1 23	10 03.3	5.9 - 7 02	121°
31	9 50.5	5.5 + 4 58	0.555	31	9 57.4	6.7 - 6 53	0.487
2 8	9 45.0	5.6 + 5 24	-4' 8	2 8	9 50.7	7.0 - 6 29	-4' 4
16	9 39.4	5.5 + 5 54	32	16	9 43.7	6.7 - 5 54	46
24	9 33.9	5.1 + 6 26	33	24	9 37.0	6.3 - 5 08	0.328
3 4	9 28.8	+ 6 59	3	3 4	9 30.7	- 4 17	4
321 Florentina 13 <sup>m</sup> 1				1172 Äneas 14 <sup>m</sup> 8			
1 23	9 59.7	5.9 +16 23	62°	1 23	9 58.1	3.4 - 8 23	226°
31	9 53.8	6.6 +16 58	0.452	31	9 54.7	3.8 - 8 21	0.747
2 8	9 47.2	7.1 +17 33	-5' 1	2 8	9 50.9	3.9 - 8 12	-6' 1
16	9 40.1	6.8 +18 07	29	16	9 47.0	3.9 - 7 58	20
24	9 33.3	6.1 +18 36	23	24	9 43.1	3.8 - 7 38	0.668
3 4	9 27.2	+18 59	2	3 4	9 39.3	- 7 14	2
884 Priamus 14 <sup>m</sup> 3				60 Echo 10 <sup>m</sup> 2			
1 23	9 52.1	3.7 + 8 42	244°	1 23	10 03.6	5.5 + 6 08	31°
31	9 48.4	4.0 + 8 53	0.744	31	9 58.1	6.8 + 6 41	0.309
2 8	9 44.4	4.1 + 9 06	-7' 8	2 8	9 51.3	7.3 + 7 26	-94'
16	9 40.3	4.1 + 9 20	16	16	9 44.0	7.0 + 8 18	21 <sup>m</sup> 6
24	9 36.2	3.9 + 9 36	15	24	9 37.0	5.9 + 9 13	0.025
3 4	9 32.3	+ 9 51	2	3 4	9 31.1	+10 06	1*
474 Prudentia 14 <sup>m</sup> 0				705 Erminia 11 <sup>m</sup> 9			
1 23	9 58.9	6.1 + 7 17	191°	1 23	10 12.9	9.4 +43 08	28°
31	9 52.8	6.8 + 8 02	0.472	31	10 03.5	10.5 +43 29	0.444
2 8	9 46.0	7.3 + 8 53	-23'	2 8	9 53.0	10.8 +43 34	-89'
16	9 38.7	7.1 + 9 48	8 <sup>m</sup> 2	16	9 42.2	10.3 +43 20	11 <sup>m</sup> 5
24	9 31.6	6.5 +10 45	54	24	9 31.9	9.0 +42 44	0.274
3 4	9 25.1	+11 39	1*	3 4	9 22.9	+41 51	1*



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1524 1939 SB				991 McDonaldia			
	h	m	°		h	m	°
1 23	10 07.4	6.1	+20 39	1 31	10 04.6	5.8	+14 48
31	10 01.3	6.7	+20 59	2 8	9 58.8	6.1	+15 22
2 8	9 54.6	7.1	+21 18	16 16	9 52.7	6.1	+15 55
16	9 47.5	7.0	+21 34	24	9 46.6	5.8	+16 26
24	9 40.5	6.5	+21 44	3 4	9 40.8	5.2	+16 53
3 4	9 34.0		+21 48	12	9 35.6		+17 16
			16 <sup>m</sup> 7				16 <sup>m</sup> 5
			148°				199°
			0.538				0.560
			-8.6				-27'
			0.393*				5 <sup>m</sup> 6
			12				0.422*
							1
309 Fraternitas				1142 Aetolia			
	h	m	°		h	m	°
1 23	10 09.2	6.0	+14 55	1 31	10 06.0	5.6	+11 56
31	10 03.2	6.9	+15 24	2 8	10 00.4	6.1	+12 31
2 8	9 56.3	7.4	+15 56	16 16	9 54.3	6.2	+13 08
16	9 48.9	7.4	+16 28	24	9 48.1	5.8	+13 45
24	9 41.5	6.9	+16 56	3 4	9 42.3	5.1	+14 19
3 4	9 34.6		+17 19	12	9 37.2		+14 48
			13 <sup>m</sup> 3				15 <sup>m</sup> 2
			203°				272°
			0.471				0.504
			-50'				-35'
			8 <sup>m</sup> 5				7 <sup>m</sup> 7
			0.295*				0.344*
			1				1
263 Dresda				339 Dorothea			
	h	m	°		h	m	°
1 23	10 10.7	5.3	+ 9 22	1 31	10 06.7	5.5	+ 4 31
31	10 05.4	6.2	+ 9 49	2 8	10 01.2	5.9	+ 5 12
2 8	9 59.2	6.6	+10 22	16 16	9 55.3	5.9	+ 5 59
16	9 52.6	6.6	+10 58	24	9 49.4	5.6	+ 6 49
24	9 46.0	6.2	+11 34	3 4	9 43.8	5.0	+ 7 0
3 4	9 39.8		+12 09	12	9 38.8		+ 8 28
			13 <sup>m</sup> 6				13 <sup>m</sup> 3
			125°				171°
			0.480				0.521
			-43'				-20'
			8 <sup>m</sup> 4				7 <sup>m</sup> 0
			0.311*				0.369*
			1				1
1034 1924 SS				1020 Arcadia			
	h	m	°		h	m	°
1 23	10 14.5	6.6	+ 9 03	1 31	10 08.0	6.1	+ 7 22
31	10 07.9	7.6	+ 9 28	2 8	10 01.9	6.5	+ 8 01
2 8	10 00.3	8.1	+ 9 59	16 16	9 55.4	6.8	+ 8 45
16	9 52.2	8.2	+10 33	24	9 48.6	6.2	+ 9 31
24	9 44.0	7.6	+11 08	3 4	9 42.4	5.4	+10 17
3 4	9 36.4		+11 41	12	9 37.0		+11 00
			16 <sup>m</sup> 0				14 <sup>m</sup> 0
			186°				278°
			0.461				0.445
			-6.3				-4.2
			0.280*				0.254*
			6				10
717 Wisibada				1196 Sheba			
	h	m	°		h	m	°
1 23	10 12.2	5.2	+12 06	1 31	10 10.3	6.9	+28 56
31	10 07.0	5.9	+12 34	2 8	10 03.4	7.5	+30 11
2 8	10 01.1	6.2	+13 04	16 16	9 55.9	7.5	+31 16
16	9 54.9	6.2	+13 34	24	9 48.4	7.0	+32 09
24	9 48.7	5.8	+14 04	3 4	9 41.4	5.9	+32 48
3 4	9 42.9		+14 31	12	9 35.5		+33 11
			14 <sup>m</sup> 9				13 <sup>m</sup> 8
			122°				127°
			0.568				0.476
			-5.8				-1.9
			0.433				0.310*
			3				10
949 Hel				1340 Yvette			
	h	m	°		h	m	°
1 31	10 07.2	7.0	+11 35	1 31	10 08.0	5.7	+11 47
2 8	10 00.2	7.6	+11 37	2 8	10 02.3	6.3	+12 17
16	9 52.6	7.7	+11 41	16 16	9 56.0	6.4	+12 50
24	9 44.9	7.3	+11 45	24	9 49.6	6.0	+13 23
3 4	9 37.6	6.2	+11 47	3 4	9 43.6	5.2	+13 52
12	9 31.4		+11 46	12	9 38.4		+14 17
			13 <sup>m</sup> 1				14 <sup>m</sup> 4
			315°				301°
			0.422				0.479
			-91'				-5.4
			10 <sup>m</sup> 7				0.306
			0.219*				3
			1				

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
380 Fiducia				580 Selene			
	h m	° '			h m	° '	
1 23	10 14.2	5.7 +17 43	50 169°	1 31	10 18.1	5.6 +14 31	40 86°
31	10 08.5	6.5 +18 33	50 0.474	2 8	10 12.5	6.0 +15 11	39 0.509
2 8	10 02.0	7.1 +19 23	48 -33'	16 18	10 06.5	6.2 +15 50	38 -5.2
16	9 54.9	7.1 +20 11	42 8 <sup>m</sup> 9	24	10 00.3	5.9 +16 28	32
24	9 47.8	6.7 +20 53	35 0.300	3 4	9 54.4	5.1 +17 00	27 0.352
3 4	9 41.1	+21 28	1*	12	9 49.3	+17 27	6*
327 Columbia				581 Tauntonia			
	h m	° '			h m	° '	
1 31	10 13.6	6.8 +17 08	27 209°	1 31	10 20.0	5.6 +31 19	76 92°
2 8	10 06.8	7.3 +17 35	25 0.467	2 8	10 14.4	6.3 +32 35	69 0.508
16 17	9 59.5	7.5 +18 00	21 -7.2	16 19	10 08.1	6.5 +33 44	57 -7'
24	9 52.0	7.1 +18 21	16 9 <sup>m</sup> 3	24	10 01.6	6.3 +34 41	42
3 4	9 44.9	6.2 +18 37	8 0.289	3 4	9 55.3	5.5 +35 23	28 0.358
12	9 38.7	+18 45	2	12	9 49.8	+35 51	1*
121 Hermione				260 Huberta			
	h m	° '			h m	° '	
1 31	10 11.8	5.5 +21 14	39 127°	1 31	10 18.7	4.8 + 7 32	34 171°
2 8	10 06.3	5.8 +21 53	36 0.574	2 8	10 13.9	5.2 + 8 06	37 0.581
16 17	10 00.5	5.9 +22 29	31 -4.2	16 19	10 08.7	5.4 + 8 43	39 -3.8
24	9 54.6	5.6 +23 00	24	24	10 03.3	5.3 + 9 22	39
3 4	9 49.0	5.0 +23 24	17 0.443	3 4	9 58.0	4.7 +10 01	36 0.451
12	9 44.0	+23 41	2*	12	9 53.3	+10 37	2*
223 Rosa				1343 Nicole			
	h m	° '			h m	° '	
1 31	10 14.8	5.8 +14 04	34 35°	1 31	10 23.9	6.7 +19 43	44 244°
2 8	10 09.0	6.5 +14 38	36 0.448	2 8	10 17.2	7.5 +20 27	42 0.436
16 18	10 02.5	6.5 +15 14	33 -55'	16 19	10 09.7	7.9 +21 09	35 -5.6
24	9 56.0	6.1 +15 47	27 10 <sup>m</sup> 6	24	10 01.8	7.6 +21 44	26
3 4	9 49.9	5.3 +16 14	22 0.259	3 4	9 54.2	6.7 +22 10	16 0.243
12	9 44.6	+16 36	1*	12	9 47.5	+22 26	3
1407 Lindelöf				1190 Pelagia			
	h m	° '			h m	° '	
1 31	10 19.5	6.4 + 3 00	23 106°	1 31	10 29.8	7.0 +14 33	40 68°
2 8	10 13.1	6.9 + 3 23	30 0.499	2 8	10 22.8	7.8 +15 13	39 0.371
16 18	10 06.2	7.0 + 3 53	34 -6.3	16 20	10 15.0	8.1 +15 52	36 -6.3
24	9 59.2	6.7 + 4 27	36	24	10 06.9	7.7 +16 28	29
3 4	9 52.5	5.8 + 5 03	35 0.337	3 4	9 59.2	6.5 +16 57	19 0.136
12	9 46.7	+ 5 38	12*	12	9 52.7	+17 16	9
91 Aegina				675 Ludmilla			
	h m	° '			h m	° '	
1 31	10 20.4	6.6 +13 05	35 55°	1 31	10 29.6	6.2 - 4 48	6 78°
2 8	10 13.8	7.4 +13 40	36 0.389	2 8	10 23.4	6.9 - 4 42	17 0.441
16 18	10 06.4	7.6 +14 16	33 -76'	16 21	10 16.5	7.2 - 4 25	30 -61'
24	9 58.8	7.1 +14 49	29 13 <sup>m</sup> 6	24	10 09.3	6.9 - 3 55	36 9 <sup>m</sup> 5
3 4	9 51.7	6.0 +15 18	21 0.165	3 4	10 02.4	6.1 - 3 19	42 0.256
12	9 45.7	+15 39	1*	12	9 56.3	- 2 37	1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
460 Scania				1095 Tulipa			
	h	m	°		h	m	°
1 31	10	29.8	5.7	1 31	10	37.2	6.5
2 8	10	24.1	6.4	2 8	10	30.7	7.6
16	10	17.7	6.7	16	10	23.1	8.4
24 <sup>21</sup>	10	11.0	6.5	24 <sup>21</sup>	10	14.7	8.1
3 4	10	04.5	5.9	3 4	10	06.6	7.3
12	9	58.6	+ 6	12	9	59.3	+21
			50				18
			14 <sup>m</sup> 3				13 <sup>m</sup> 7
			140°				184°
			0.469				0.373
			-42'				-3.7
			8 <sup>m</sup> 6				0.140
			0.293*				5*
			1				
583 Klotilde				703 Noëmi			
	h	m	°		h	m	°
1 31	10	29.6	5.0	1 31	10	36.7	6.8
2 8	10	24.6	5.9	2 8	10	29.9	7.9
16	10	18.7	6.3	16	10	22.0	8.3
24 <sup>21</sup>	10	12.4	6.1	24 <sup>22</sup>	10	13.7	8.1
3 4	10	06.3	5.5	3 4	10	05.6	7.1
12	10	00.8	- 1	12	9	58.5	+ 8
			11				44
			12 <sup>m</sup> 3				14 <sup>m</sup> 3
			6°				112°
			0.432				0.364
			-70'				-75'
			10 <sup>m</sup> 9				14 <sup>m</sup> 3
			0.241*				0.125*
			1				1
1133 Lugduna				987 Wallia			
	h	m	°		h	m	°
1 31	10	35.9	7.5	1 31	10	36.0	5.3
2 8	10	28.4	8.5	2 8	10	30.7	5.8
16	10	19.9	9.0	16	10	24.9	6.1
24 <sup>21</sup>	10	10.9	8.5	24 <sup>22</sup>	10	18.8	6.2
3 4	10	02.4	7.5	3 4	10	12.6	5.7
12	9	54.9	+21	12	10	06.9	+ 9
			41				04
			14 <sup>m</sup> 1				15 <sup>m</sup> 1
			132°				180°
			0.397				0.588
			-5.5				-37'
			0.183				4 <sup>m</sup> 3
			5				0.462*
							1
1264 Letaba				687 Tinette			
	h	m	°		h	m	°
1 31	10	32.0	5.2	1 31	10	40.4	7.2
2 8	10	26.8	6.2	2 8	10	33.2	8.0
16	10	20.6	6.6	16	10	25.2	8.3
24 <sup>21</sup>	10	14.0	6.8	24 <sup>22</sup>	10	16.9	7.9
3 4	10	07.2	6.2	3 4	10	09.0	7.3
12	10	01.0	-25	12	10	01.7	+11
			26				57
			13 <sup>m</sup> 2				15 <sup>m</sup> 3
			274°				97°
			0.463				0.475
			-43'				-73'
			9 <sup>m</sup> 6				6 <sup>m</sup> 9
			0.318*				0.301*
			1				1
1282 Utopia				1376 Michelle			
	h	m	°		h	m	°
1 31	10	34.6	6.4	1 31	10	40.5	6.2
2 8	10	28.2	7.1	2 8	10	34.3	7.3
16	10	21.1	7.4	16	10	27.0	8.0
24 <sup>21</sup>	10	13.7	7.1	24 <sup>22</sup>	10	19.0	7.9
3 4	10	06.6	6.7	3 4	10	11.1	7.4
12	9	59.9	+ 7	12	10	03.7	+11
			00				14
			15 <sup>m</sup> 7				15 <sup>m</sup> 6
			98°				203°
			0.494				0.428
			-12.0				-4.7
			0.349*				0.228
			12*				3
290 Bruna				445 Edna			
	h	m	°		h	m	°
1 31	10	51.8	13.9	1 31	10	37.2	5.6
2 8	10	37.9	15.6	2 8	10	31.6	6.2
16	10	22.3	15.1	16	10	25.4	6.5
24 <sup>21</sup>	10	07.2	13.0	24 <sup>23</sup>	10	18.9	6.5
3 4	9	54.2	9.5	3 4	10	12.4	6.1
12	9	44.7	+42	12	10	06.3	-11
			15				35
			12 <sup>m</sup> 5				13 <sup>m</sup> 5
			16°				140°
			0.248				0.572
			-233'				-47'
			37 <sup>m</sup> 5				4 <sup>m</sup> 3
			9.943*				0.450*
			1				1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
750 Oskar				1251 Hedera					
	h	m	°		h	m	°		
1 31	10	38.8	5.4 +15 58 50	11°	2 8	10	40.7	6.0 +10 07 51	150°
2 8	10	33.4	6.9 +16 48 50	0.323	16	10	34.7	6.6 +10 58 51	0.491
16	10	26.5	7.5 +17 38 47	-105'	24	10	28.1	6.5 +11 49 50	-4.1
24	10	19.0	7.3 +18 25 36	20 <sup>m</sup> 5	3 4	10	21.6	6.2 +12 39 46	
3 4	10	11.7	6.3 +19 01 24	0.051	12	10	15.4	5.4 +13 25 38	0.324
12	10	05.4	+19 25	1*	20	10	10.0	+14 03	5*
144 Vibilia				417 Suevia					
	h	m	°		h	m	°		
1 31	10	41.3	6.0 +15 19 46	125°	2 8	10	40.3	5.5 - 0 05 38	340°
2 8	10	35.3	6.8 +16 05 46	0.489	16	10	34.8	6.0 + 0 33 50	0.387
16	10	28.5	7.2 +16 51 44	-39'	24	10	28.8	6.3 + 1 23 57	-4.6
24	10	21.3	7.1 +17 35 38	7 <sup>m</sup> 6	3 4	10	22.5	5.8 + 2 20 59	
3 4	10	14.2	6.5 +18 13 30	0.323	12	10	16.7	4.9 + 3 19 59	0.163
12	10	07.7	+18 43	1*	20	10	11.8	+ 4 18	2
240 Vanadis				1058 Grubba					
	h	m	°		h	m	°		
1 31	10	42.8	5.8 +10 01 43	76°	1 31	10	47.3	6.1 + 1 56 30	210°
2 8	10	37.0	6.8 +10 44 48	0.420	2 8	10	41.2	7.2 + 2 26 40	0.409
16	10	30.2	7.3 +11 32 47	-58'	16	10	34.0	8.0 + 3 06 48	-58'
24	10	22.9	7.1 +12 19 44	11 <sup>m</sup> 2	24	10	26.0	8.1 + 3 54 52	10 <sup>m</sup> 6
3 4	10	15.8	6.3 +13 03 38	0.217	3 4	10	17.9	7.7 + 4 46 54	0.199
12	10	09.5	+13 41	1*	12	10	10.2	+ 5 40	1*
826 Henrika				1054 Forsytia					
	h	m	°		h	m	°		
2 8	10	38.4	6.1 - 2 34 26	276°	2 8	10	44.5	6.1 +22 57 55	121°
16	10	32.3	6.7 - 2 08 36	0.442	16	10	38.4	6.7 +23 52 48	0.500
24	10	25.6	6.9 - 1 32 45	-54'	24	10	31.7	6.7 +24 40 39	-4.4
3 4	10	18.7	6.6 - 0 47 51	9 <sup>m</sup> 6	3 4	10	25.0	6.3 +25 19 28	
12	10	12.1	5.7 + 0 04 51	0.253	12	10	18.7	5.5 +25 47 16	0.341
20	10	06.4	+ 0 55	1*	20	10	13.2	+26 03	3*
639 Latona				925 Alphonsina					
	h	m	°		h	m	°		
2 8	10	38.2	5.8 - 1 47 16	170°	2 8	10	48.2	7.8 -14 26 48	21°
16	10	32.4	6.3 - 1 31 24	0.524	16	10	40.4	8.5 -15 14 32	0.397
24	10	26.1	6.4 - 1 07 29	-45'	24	10	31.9	8.9 -15 46 13	-123'
3 4	10	19.7	5.9 - 0 38 31	6 <sup>m</sup> 1	3 4	10	23.0	8.4 -15 59 3	10 <sup>m</sup> 7
12	10	13.8	5.4 - 0 07 33	0.374	12	10	14.6	7.4 -15 56 17	0.195
20	10	08.4	+ 0 26	1*	20	10	07.2	-15 39	1
693 Zerbinetta				169 Zelia					
	h	m	°		h	m	°		
2 8	10	41.7	7.1 +17 14 15	232°	2 8	10	47.8	7.4 +11 25 33	190°
16	10	34.6	7.7 +17 29 13	0.476	16	10	40.4	8.1 +11 58 34	0.426
24	10	26.9	7.6 +17 42 7	-74'	24	10	32.3	8.2 +12 32 32	-70'
3 4	10	19.3	7.2 +17 49 0	7 <sup>m</sup> 8	3 4	10	24.1	7.8 +13 04 25	9 <sup>m</sup> 9
12	10	12.1	6.3 +17 49 8	0.303	12	10	16.3	6.8 +13 29 18	0.224
20	10	05.8	+17 41	1*	20	10	09.5	+13 47	1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
836 Jole				1275 Cimbria			
	h	m	°		h	m	°
2 8	10	47.8	7.2	+ 1	26	49	125°
16	10	40.6	8.0	+ 2	15	56	0.389
24	10	32.6	8.0	+ 3	11	62	-59'
3 4	10	24.6	7.4	+ 4	13	61	12 <sup>m</sup> 2
12	10	17.2	6.3	+ 5	14	58	0.165*
20	10	10.9		+ 6	12		1*
38 Leda				658 Asteria			
	h	m	°		h	m	°
2 8	10	46.6	6.6	+ 0	33	8	42°
16	10	40.0	7.3	+ 0	41	18	0.391
24	10	32.7	7.3	+ 0	59	24	-96'
3 4	10	25.4	6.8	+ 1	23	29	12 <sup>m</sup> 7
12	10	18.6	5.7	+ 1	52	27	0.170*
20	10	12.9		+ 2	19		1*
1279 Uganda				412 Elisabetha			
	h	m	°		h	m	°
2 8	10	48.3	7.3	+ 8	20	25	268°
16	10	41.0	8.2	+ 8	45	29	0.396
24	10	32.8	8.5	+ 9	14	29	-7.7
3 4	10	24.3	8.3	+ 9	43	27	
12	10	16.0	7.3	+10	10	22	0.177*
20	10	08.7		+10	32		5*
859 Bouzareah				1360 1935 OD			
	h	m	°		h	m	°
2 8	10	46.5	6.5	+27	22	36	97°
16	10	40.0	7.0	+27	58	27	0.521
24	10	33.0	7.0	+28	25	17	-7.4
3 4	10	26.0	6.5	+28	42	5	
12	10	19.5	5.7	+28	47	6	0.374
20	10	13.8		+28	41		3
1091 Spiraea				981 Martina			
	h	m	°		h	m	°
2 8	10	44.1	5.3	+ 9	41	37	58°
16	10	38.8	5.7	+10	18	35	0.512
24	10	33.1	5.8	+10	53	34	-6.3
3 4	10	27.3	5.5	+11	27	31	
12	10	21.8	4.9	+11	58	25	0.354*
20	10	16.9		+12	23		2*
647 Adelgunde				67 Asia			
	h	m	°		h	m	°
2 8	10	49.1	6.9	- 5	17	19	69°
16	10	42.2	7.6	- 4	58	34	0.373
24	10	34.6	7.6	- 4	24	44	-82'
3 4	10	27.0	7.0	- 3	40	51	13 <sup>m</sup> 7
12	10	20.0	6.0	- 2	49	54	0.142*
20	10	14.0		- 1	55		1*



1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
878 Mildred				1015 Christa			
	h	m	°		h	m	°
2	8	10 53.9	6.7 + 5 59 44	2	8	10 56.3	5.0 +14 16 52
	16	10 47.2	7.4 + 6 43 49		16	10 51.3	5.7 +15 08 51
	24	10 39.8	7.6 + 7 32 50		24	10 45.6	5.8 +15 59 48
3	4 <sup>27</sup>	10 32.2	7.2 + 8 22 48	3	4 <sup>28</sup>	10 39.8	5.6 +16 47 42
	12	10 25.0	6.4 + 9 10 45		12	10 34.2	5.1 +17 29 35
	20	10 18.6	+ 9 55 45		20	10 29.1	+18 04 35
			17 <sup>m</sup> 9				13 <sup>m</sup> 3
			145°				122°
			0.452				0.532
			-5.1				-26
			0.266				6 <sup>m</sup> 9
			4				0.383
							1*
1406 Komppa				715 Transvaalia			
	h	m	°		h	m	°
2	8	10 55.0	7.1 + 6 44 5	2	8	11 01.1	6.7 +27 41 47
	16	10 47.9	7.9 + 6 49 8		16	10 54.4	7.5 +28 28 39
	24	10 40.0	8.1 + 6 57 11		24	10 46.9	7.8 +29 07 26
3	4 <sup>27</sup>	10 31.9	7.7 + 7 08 9	3	4 <sup>28</sup>	10 39.1	7.4 +29 33 12
	12	10 24.2	6.7 + 7 17 7		12	10 31.7	6.7 +29 45 2
	20	10 17.5	+ 7 24 7		20	10 25.0	+29 43 1
			15 <sup>m</sup> 8				13 <sup>m</sup> 7
			89°				166°
			0.434				0.477
			-10.1				-55
			0.238				8 <sup>m</sup> 7
			12*				0.312
							1*
1412 Lagrula				1042 Amazone			
	h	m	°		h	m	°
2	8	10 55.7	7.2 +16 07 56	2	8	11 03.8	6.4 +36 43 46
	16	10 48.5	8.3 +17 03 52		16	10 57.4	7.1 +37 29 35
	24	10 40.2	8.4 +17 55 44		24	10 50.3	7.3 +38 04 21
3	4 <sup>27</sup>	10 31.8	7.8 +18 39 30	3	4 <sup>1</sup>	10 43.0	7.1 +38 25 7
	12	10 24.0	6.4 +19 09 16		12	10 35.9	6.4 +38 32 7
	20	10 17.6	+19 25 16		20	10 29.5	+38 25 7
			13 <sup>m</sup> 8				13 <sup>m</sup> 9
			65°				157°
			0.328				0.555
			-6.0				-38
			0.058				6 <sup>m</sup> 6
			3				0.430
							1*
16 Psyche				1086 Nata			
	h	m	°		h	m	°
2	8	10 53.0	5.6 + 7 25 40	2	8	11 02.3	5.5 + 1 02 9
	16	10 47.4	6.1 + 8 05 44		16	10 56.8	6.2 + 1 11 15
	24	10 41.3	6.3 + 8 49 44		24	10 50.6	6.4 + 1 26 21
3	4 <sup>27</sup>	10 35.0	6.0 + 9 33 41	3	4 <sup>1</sup>	10 44.2	6.4 + 1 47 23
	12	10 29.0	5.4 +10 14 37		12	10 37.8	5.8 + 2 10 23
	20	10 23.6	+10 51 37		20	10 32.0	+ 2 33 23
			10 <sup>m</sup> 2				12 <sup>m</sup> 9
			131°				45°
			0.507				0.490
			-36				-64
			7 <sup>m</sup> 2				7 <sup>m</sup> 5
			0.347				0.325
			1*				1*
485 Genua				885 Ulrike			
	h	m	°		h	m	°
2	8	10 53.4	4.8 - 8 12 52	2	8	11 01.5	5.0 + 6 53 36
	16	10 48.6	5.8 - 7 20 70		16	10 56.5	5.5 + 7 29 40
	24	10 42.8	6.0 - 6 10 82		24	10 51.0	5.8 + 8 09 40
3	4 <sup>28</sup>	10 36.8	5.6 - 4 48 89	3	4 <sup>2</sup>	10 45.2	5.8 + 8 49 39
	12	10 31.2	4.7 - 3 19 92		12	10 39.4	5.3 + 9 28 36
	20	10 26.5	- 1 47 92		20	10 34.1	+10 04 36
			10 <sup>m</sup> 7				14 <sup>m</sup> 5
			40°				162°
			0.379				0.563
			-40				-28
			14 <sup>m</sup> 9				5 <sup>m</sup> 4
			0.154				0.426
			1*				1*
476 Hedwig				545 Messalina			
	h	m	°		h	m	°
2	8	10 58.1	6.1 - 7 04 3	2	8	11 05.7	5.4 + 4 47 14
	16	10 52.0	7.0 - 7 07 9		16	11 00.3	6.1 + 5 01 18
	24	10 45.0	7.5 - 6 58 20		24	10 54.2	6.4 + 5 19 19
3	4 <sup>28</sup>	10 37.5	7.3 - 6 38 29	3	4 <sup>2</sup>	10 47.8	6.4 + 5 38 21
	12	10 30.2	6.6 - 6 09 35		12	10 41.4	6.0 + 5 59 19
	20	10 23.6	- 5 34 35		20	10 35.4	+ 6 18 19
			11 <sup>m</sup> 6				12 <sup>m</sup> 8
			246°				239°
			0.438				0.553
			-76				-50
			9 <sup>m</sup> 3				5 <sup>m</sup> 0
			0.251				0.414
			1*				1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1374 Isora				1173 Anchises			
	h	m	°		h	m	°
2 16	11	07.0	7.7 + 0 23	2 16	11	04.5	3.6 - 1 56
24	10	59.3	8.1 + 0 56	24	11	00.9	3.9 - 1 39
3 4	10	51.2	8.0 + 1 34	3 4	10	57.0	3.8 - 1 20
12	10	43.2	7.5 + 2 15	12	10	53.2	3.8 - 0 58
20	10	35.7	6.4 + 2 56	20	10	49.4	3.4 - 0 35
28	10	29.3	+ 3 34	28	10	46.0	- 0 12
			16 <sup>m</sup> 4				15 <sup>m</sup> 1
			148°				219°
			0.449				0.753
			-7.4				-7.3
			0.261				0.671
			13				2
699 Hela				840 Zenobia			
	h	m	°		h	m	°
2 8	11	10.0	5.4 -15 45	2 16	11	09.4	5.6 - 8 48
16	11	04.6	6.2 -15 36	24	11	03.8	6.1 - 8 35
24	10	58.4	6.6 -15 15	3 4	10	57.7	6.2 - 8 13
3 4	10	51.8	6.7 -14 43	12	10	51.5	5.9 - 7 42
12	10	45.1	6.4 -13 59	20	10	45.6	5.2 - 7 05
20	10	38.7	-13 08	28	10	40.4	- 6 25
			16 <sup>m</sup> 4				13 <sup>m</sup> 2
			210°				255°
			0.558				0.508
			-26				-51
			4 <sup>m</sup> 7				6 <sup>m</sup> 9
			0.432				0.352*
			1				1
1415 Malautra				945 Barcelona			
	h	m	°		h	m	°
2 8	11	13.2	5.8 + 4 28	2 16	11	20.8	10.8 -25 30
16	11	07.4	7.5 + 4 45	24	11	10.0	11.8 -27 08
24	10	59.9	8.3 + 5 11	3 4	10	58.2	12.2 -28 22
3 4	10	51.6	8.2 + 5 42	12	10	46.0	11.6 -29 08
12	10	43.4	7.6 + 6 12	20	10	34.4	10.2 -29 28
20	10	35.8	+ 6 41	28	10	24.2	-29 25
			13 <sup>m</sup> 5				12 <sup>m</sup> 6
			320°				43°
			0.319				0.374
			-7.2				-163
			0.038				10 <sup>m</sup> 2
			3				0.171*
							1
636 Erika				1240 Centenaria			
	h	m	°		h	m	°
2 8	11	11.8	5.5 +15 22	2 16	11	11.7	6.3 + 0 28
16	11	06.3	6.3 +15 59	24	11	05.4	6.6 + 0 45
24	11	00.0	6.6 +16 35	3 4	10	58.8	6.8 + 1 07
3 4	10	53.4	6.6 +17 08	12	10	52.0	6.4 + 1 31
12	10	46.8	6.2 +17 35	20	10	45.6	5.8 + 1 56
20	10	40.6	+17 55	28	10	39.8	+ 2 20
			13 <sup>m</sup> 3				14 <sup>m</sup> 5
			190°				178°
			0.533				0.527
			-43				-9.4
			6 <sup>m</sup> 0				0.376*
			0.386*				5*
			1*				
44 Nysa				719 Albert			
	h	m	°		h	m	°
2 8	11	11.8	5.2 + 7 48	2 8	11	11.7	5.3 - 1 02
16	11	06.6	6.3 + 8 44	16	11	06.4	6.0 - 0 26
24	11	00.3	7.1 + 9 44	24	11	00.4	6.2 + 0 16
3 4	10	53.2	6.9 +10 47	3 4	10	54.2	6.4 + 1 04
12	10	46.3	6.1 +11 42	12	10	47.8	6.0 + 1 53
20	10	40.2	+12 29	20	10	41.8	+ 2 43
			9 <sup>m</sup> 1				19 <sup>m</sup> 9
			36°				196°
			0.333				0.598
			-5.4				-12
			0.066*				3 <sup>m</sup> 5
			2*				0.473
							1
1204 Renzia				304 Olga			
	h	m	°		h	m	°
2 16	11	09.3	7.3 + 6 56	2 8	11	16.2	5.2 + 4 22
24	11	02.0	8.1 + 7 38	16	11	11.0	6.2 + 5 31
3 4	10	53.9	8.0 + 8 25	24	11	04.8	6.7 + 6 47
12	10	45.9	7.6 + 9 09	3 4	10	58.1	6.9 + 8 07
20	10	38.3	6.7 + 9 50	12	10	51.2	6.5 + 9 26
28	10	31.6	+10 23	20	10	44.7	+10 41
			16 <sup>m</sup> 1				13 <sup>m</sup> 4
			218°				200°
			0.453				0.465
			-6.7				-14
			0.267				8 <sup>m</sup> 5
			9				0.284*
							1

# OPPOSITION EPHEMERIDES

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
13 Egeria				495 Eulalia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	17.1	8.4	2 16	11	15.4	6.6
24	11	08.7	9.1	24	11	08.8	7.0
3 4	10	59.6	8.9	3 4	11	01.8	7.2
12	10	50.7	8.1	12	10	54.6	6.6
20	10	42.6	6.5	20	10	48.0	5.8
28	10	36.1	+33	28	10	42.2	+7
			02 37				04 46
			28°				119°
			0.378				0.427
			-98'				-56'
			15 <sup>m</sup> 3				10 <sup>m</sup> 2
			0.165				0.227
			1*				1*
467 Laura				9 Metis			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	12.8	6.2	2 16	11	17.0	7.2
24	11	06.6	6.7	24	11	09.8	7.8
3 4	10	59.9	6.7	3 4	11	02.0	7.9
12	10	53.2	6.3	12	10	54.1	7.1
20	10	46.9	5.5	20	10	47.0	5.9
28	10	41.4	+1	28	10	41.1	+18
			58 22				59 54
			101°				75°
			0.483				0.370
			-62'				-6' 4
			7 <sup>m</sup> 6				0.134
			0.312				2*
			1*				
164 Eva				954 Li			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	17.5	8.0	2 16	11	19.8	5.2
24	11	09.5	8.4	24	11	14.6	5.7
3 4	11	01.1	8.3	3 4	11	08.9	5.8
12	10	52.8	7.8	12	11	03.1	5.7
20	10	45.0	7.0	20	10	57.4	5.2
28	10	38.0	+40	28	10	52.2	+4
			30 58				19 34
			132°				228°
			0.526				0.549
			-5' 3				-34'
			0.399				5 <sup>m</sup> 7
			8*				0.406
							1
609 Fulvia				77 Frigga			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	12.4	5.3	2 16	11	23.4	6.4
24	11	07.1	5.8	24	11	17.0	7.0
3 4	11	01.3	5.9	3 4	11	10.0	7.1
12	10	55.4	5.6	12	11	02.9	6.8
20	10	49.8	4.9	20	10	56.1	5.9
28	10	44.9	+4	28	10	50.2	+5
			31 42				28 34
			239°				90°
			0.498				0.433
			-39'				-69'
			7 <sup>m</sup> 8				10 <sup>m</sup> 1
			0.334				0.235
			1*				1*
285 Regina				714 Ulula			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	13.8	6.0	2 16	11	22.9	5.6
24	11	07.8	6.4	24	11	17.3	6.5
3 4	11	01.4	6.6	3 4	11	10.8	6.7
12	10	54.8	6.4	12	11	04.1	6.5
20	10	48.4	5.8	20	10	57.6	5.6
28	10	42.6	-9	28	10	52.0	-18
			33 1				37 15
			210°				62°
			0.565				0.393
			-50'				-58'
			4 <sup>m</sup> 4				13 <sup>m</sup> 3
			0.433				0.187
			1				1*
411 Xanthe				1079 Mimosa			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
2 16	11	13.9	5.7	2 16	11	22.9	5.6
24	11	08.2	6.4	24	11	17.3	6.4
3 4	11	01.8	6.4	3 4	11	10.9	6.5
12	10	55.4	6.1	12	11	04.4	6.3
20	10	49.3	5.1	20	10	58.1	5.6
28	10	44.2	+22	28	10	52.5	+3
			58 69				37 33
			243°				89°
			0.494				0.459
			-3' 2				-6' 6
			0.336				0.276
			2				5

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
266 Aline				1454 1936 DO			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	26.6	5.6 -15 09 19	2 16	11	32.3	6.7 + 5 16 17
24	11	21.0	6.1 -14 50 33	24	11	25.6	7.8 + 5 33 22
3 4	11	14.9	6.3 -14 17 46	3 4	11	17.8	8.2 + 5 55 21
12	11	08.6	6.2 -13 31 54	12	11	09.6	7.8 + 6 16 19
20	11	02.4	5.5 -12 37 61	20	11	01.8	6.6 + 6 35 12
28	10	56.9	-11 36 2	28	10	55.2	+ 6 47 1*
394 Arduina				359 Georgia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	27.5	5.8 +12 53 44	2 16	11	31.3	6.1 + 7 25 30
24	11	21.7	6.4 +13 37 43	24	11	25.2	6.7 + 7 55 31
3 4	11	15.3	6.6 +14 20 39	3 4	11	18.5	7.0 + 8 26 31
12	11	08.7	6.5 +14 59 33	12	11	11.5	6.8 + 8 57 27
20	11	02.2	5.9 +15 32 24	20	11	04.7	6.3 + 9 24 22
28	10	56.3	+15 56 2	28	10	58.4	+ 9 46 1*
850 Altona				195 Eurykleia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	26.3	5.0 +18 44 77	2 16	11	31.8	6.0 + 7 59 26
24	11	21.3	5.8 +20 01 73	24	11	25.8	6.7 + 8 25 27
3 4	11	15.5	6.1 +21 14 65	3 4	11	19.1	7.0 + 8 52 24
12	11	09.4	6.0 +22 19 54	12	11	12.1	6.9 + 9 16 20
20	11	03.4	5.3 +23 13 39	20	11	05.2	6.2 + 9 36 15
28	10	58.1	+23 52 1*	28	10	59.0	+ 9 51 2*
1110 Jaroslawa				1393 1936 KD			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	30.5	6.5 - 6 13 30	2 16	11	34.9	6.0 +12 56 48
24	11	24.0	7.4 - 5 43 41	24	11	28.9	7.2 +13 44 47
3 4	11	16.6	8.0 - 5 02 51	3 4	11	21.7	7.7 +14 31 42
12	11	08.6	7.8 - 4 11 57	12	11	14.0	7.7 +15 13 31
20	11	00.8	7.2 - 3 14 58	20	11	06.3	6.8 +15 44 19
28	10	53.6	- 2 16 1*	28	10	59.5	+16 03 7*
1278 Kenya				1380 Volodia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	30.5	6.5 +19 20 63	2 16	11	36.5	5.6 + 7 21 16
24	11	24.0	7.3 +20 23 60	24	11	30.9	6.5 + 7 37 19
3 4	11	16.7	7.7 +21 23 50	3 4	11	24.4	6.9 + 7 56 18
12	11	09.0	7.4 +22 13 39	12	11	17.5	6.9 + 8 14 15
20	11	01.6	6.8 +22 52 25	20	11	10.6	6.3 + 8 29 10
28	10	54.8	+23 17 5*	28	11	04.3	+ 8 39 7*
566 Stereoskopia				577 Rhea			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
2 16	11	27.5	4.9 +10 42 38	2 16	11	37.7	5.1 + 0 11 20
24	11	22.6	5.5 +11 20 38	24	11	32.6	5.8 + 0 31 24
3 4	11	17.1	5.6 +11 58 36	3 4	11	26.8	6.2 + 0 55 29
12	11	11.5	5.5 +12 34 31	12	11	20.6	6.2 + 1 24 31
20	11	06.0	5.0 +13 05 24	20	11	14.4	5.8 + 1 55 28
28	11	01.0	+13 29 2	28	11	08.6	+ 2 23 1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
128 Nemesis				994 Otthild			
	h	m	°		h	m	°
2 16	11	39.4	5.6	2 16	11	48.6	6.8
24	11	33.8	6.3	24	11	41.8	7.8
3 4	11	27.5	6.8	3 4	11	34.0	8.4
12	11	20.7	6.6	12	11	25.6	8.4
20	11	14.1	6.1	20	11	17.2	7.9
28	11	08.0	+15	28	11	09.3	+10
			01				28
			49				16
			142°				188°
			0.482				0.450
			-49'				-87'
			7 <sup>m</sup> 9				7 <sup>m</sup> 7
			0.312*				0.262*
			1				1
598 Octavia				999 Zachia			
	h	m	°		h	m	°
2 16	11	41.3	5.8	2 24	11	41.5	5.9
24	11	35.5	6.5	3 4	11	35.6	6.3
3 4	11	29.0	6.8	12	11	29.3	6.5
12	11	22.2	6.7	20	11	22.8	6.2
20	11	15.5	6.2	28	11	16.6	5.4
28	11	09.3	+23	4 5	11	11.2	-
			32				8
			59				27
			124°				41
			0.509				198°
			-36'				0.499
			7 <sup>m</sup> 0				-4.4
			0.356				0.337*
			1				12*
1468 1938 PA				766 Moguntia			
	h	m	°		h	m	°
2 24	11	43.1	7.7	2 24	11	42.8	6.4
3 4	11	35.4	8.5	3 4	11	36.4	6.9
12	11	26.9	8.7	12	11	29.5	6.9
20	11	18.2	8.3	20	11	22.6	6.4
28	11	09.9	7.4	28	11	16.2	5.6
4 5	11	02.5	-	4 5	11	10.6	+
			9				7
			14				53
			219°				22
			0.432				86°
			-8.9				0.481
			0.237*				-72'
			5*				7 <sup>m</sup> 5
							0.309*
							1*
1112 Polonia				707 Steina			
	h	m	°		h	m	°
2 24	11	41.3	5.9	2 24	11	46.1	7.3
3 4	11	35.4	6.3	3 4	11	38.8	8.0
12	11	29.1	6.4	12	11	30.8	8.2
20	11	22.7	6.0	20	11	22.6	7.7
28	11	16.7	5.4	28	11	14.9	6.5
4 5	11	11.3	-	4 5	11	08.4	-
			8				5
			16				30
			143°				31
			0.517				158°
			-8.2				0.380
			0.363*				-85'
			5*				12 <sup>m</sup> 4
							0.150*
							1*
785 Zwetana				986 Amelia			
	h	m	°		h	m	°
2 16	11	45.4	5.0	2 24	11	43.3	5.5
24	11	40.4	6.5	3 4	11	37.8	6.0
3 4	11	33.9	7.5	12	11	31.8	6.0
12	11	26.4	7.5	20	11	25.8	5.6
20	11	18.9	6.7	28	11	20.2	5.1
28	11	12.2	+29	4 5	11	15.1	+25
			11				18
			74				50
			337°				167°
			0.324				0.574
			-100'				-25'
			20 <sup>m</sup> 8				5 <sup>m</sup> 3
			0.067*				0.447
			1				1
315 Constantia				1479 1938 DE			
	h	m	°		h	m	°
2 16	11	46.7	5.8	2 24	11	48.0	7.1
24	11	40.9	6.9	3 4	11	40.9	7.8
3 4	11	34.0	7.7	12	11	33.1	7.6
12	11	26.3	7.7	20	11	25.5	7.1
20	11	18.6	7.2	28	11	18.4	5.8
28	11	11.4	+	4 5	11	12.6	+
			1				8
			45				31
			204°				26
			0.414				0.388
			-58'				-8.5
			10 <sup>m</sup> 4				0.163*
			0.204*				12*
			1				



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
345 Tercidina 11 <sup>m</sup> 3				271 Penthesilea 13 <sup>m</sup> 2			
2	24	11 46.3	6.0 -10 40 51	2	24	11 52.8	5.6 -0 34 27
3	4	11 40.3	6.7 -9 49 66	3	4	11 47.2	6.1 -0 07 31
	12	11 33.6	7.0 -8 43 77		12	11 41.1	6.3 +0 24 34
	20	11 26.6	6.4 -7 26 83		20	11 34.8	6.0 +0 58 32
	28	11 20.2	5.4 -6 03 82		28	11 28.8	5.4 +1 30 31
4	5	11 14.8	-4 41 1	4	5	11 23.4	+2 01 1
1550 1937 WD 16 <sup>m</sup> 2				525 Adelaide 14 <sup>m</sup> 2			
2	24	11 50.2	6.8 +14 43 49	2	24	11 53.2	5.4 +4 05 41
3	4	11 43.4	7.3 +15 32 44	3	4	11 47.8	5.8 +4 46 42
	12	11 36.1	7.3 +16 16 36		12	11 42.0	5.8 +5 28 40
	20	11 28.8	6.8 +16 52 25		20	11 36.2	5.5 +6 08 37
	28	11 22.0	6.2 +17 17 16		28	11 30.7	5.0 +6 45 31
4	5	11 15.8	+17 33 5	4	5	11 25.7	+7 16 1
1561 1941 CG 14 <sup>m</sup> 2				548 Kressida 13 <sup>m</sup> 2			
2	24	11 46.9	5.1 -4 30 31	2	24	11 59.3	6.8 +6 16 60
3	4	11 41.8	5.7 -3 59 38	3	4	11 52.5	7.7 +7 16 60
	12	11 36.1	5.9 -3 21 43		12	11 44.8	7.8 +8 16 54
	20	11 30.2	5.7 -2 38 45		20	11 37.0	7.4 +9 10 46
	28	11 24.5	5.1 -1 53 43		28	11 29.6	6.2 +9 56 34
4	5	11 19.4	-1 10 1	4	5	11 23.4	+10 30 1
1509 Esclangona 13 <sup>m</sup> 9				524 Fidelio 12 <sup>m</sup> 8			
2	24	11 57.8	8.6 -42 16 112	2	24	11 59.5	6.4 -5 39 14
3	4	11 49.2	10.9 -44 08 75	3	4	11 53.1	7.1 -5 25 21
	12	11 38.3	12.1 -45 23 32		12	11 46.0	7.5 -5 04 27
	20	11 26.2	11.9 -45 55 12		20	11 38.5	7.1 -4 37 30
	28	11 14.3	10.2 -44 49 54		28	11 31.4	6.5 -3 37 30
4	5	11 04.1	-44 49 1	4	5	11 24.9	-3 37 1
1149 1929 PF 14 <sup>m</sup> 0				1274 Delportia 13 <sup>m</sup> 4			
2	24	11 54.0	5.4 -17 05 13	2	24	12 02.3	6.1 -3 31 7
3	4	11 48.6	6.2 -16 52 26	3	4	11 56.2	7.5 -3 24 18
	12	11 42.4	6.3 -16 26 37		12	11 48.7	8.2 -3 06 26
	20	11 36.1	6.2 -15 49 46		20	11 40.5	8.1 -2 40 29
	28	11 29.9	5.6 -15 03 52		28	11 32.4	7.1 -2 11 28
4	5	11 24.3	-14 11 5	4	5	11 25.3	-1 43 13
246 Asporina 11 <sup>m</sup> 6				172 Baucis 11 <sup>m</sup> 0			
2	24	11 51.5	4.9 +3 26 86	2	24	12 03.1	6.8 -6 07 5
3	4	11 46.6	5.6 +4 52 91	3	4	11 56.3	7.9 -6 02 15
	12	11 41.0	6.0 +6 23 89		12	11 48.4	8.2 -5 47 21
	20	11 35.0	5.8 +7 52 85		20	11 40.2	8.2 -5 26 26
	28	11 29.2	5.0 +9 17 75		28	11 32.0	7.5 -5 00 28
4	5	11 24.2	+10 32 1	4	5	11 24.5	-4 32 1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
615 Roswitha				1167 1930 PB			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	02.4	5.6 + 1 41 30	2 24	12	05.2	4.3 - 7 04 27
3 4	11	56.8	6.7 + 2 11 36	3 4	12	00.9	5.0 - 6 37 35
12	11	50.1	7.1 + 2 47 38	12 19	11	55.9	5.4 - 6 02 39
20 17	11	43.0	7.1 + 3 25 34	20 19	11	50.5	5.3 - 5 23 43
28	11	35.9	6.4 + 3 59 31	28	11	45.2	5.0 - 4 40 44
4 5	11	29.5	+ 4 30	4 5	11	40.2	- 3 56
			12 <sup>m</sup> 4				13 <sup>m</sup> 8
			291°				261°
			0.409				0.538
			-82'				-5.4
			11 <sup>m</sup> 4				0.392
			0.197*				2
			1				
988 Appella				520 Franziska			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	01.3	5.0 + 1 38 33	2 24	12	08.4	5.7 +11 12 32
3 4	11	56.3	5.6 + 2 11 35	3 4	12	02.7	6.5 +11 44 29
12	11	50.7	5.7 + 2 46 35	12 19	11	56.2	6.8 +12 13 25
20 17	11	45.0	5.6 + 3 21 34	20 19	11	49.4	6.6 +12 38 18
28	11	39.4	5.1 + 3 55 31	28	11	42.8	6.1 +12 56 9
4 5	11	34.3	+ 4 26	4 5	11	36.7	+13 05
			15 <sup>m</sup> 8				14 <sup>m</sup> 2
			152°				111°
			0.583				0.498
			-6.9				-63'
			0.461				6 <sup>m</sup> 9
			3				0.336*
							1
876 Scott				902 Probitas			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	02.9	4.7 + 5 37 56	2 24	12	10.0	6.4 - 0 58 25
3 4	11	58.2	5.4 + 6 33 59	3 4	12	03.6	7.3 - 0 33 30
12	11	52.8	5.6 + 7 32 57	12 19	11	56.3	7.7 - 0 03 33
20 18	11	47.2	5.6 + 8 29 53	20 19	11	48.6	7.6 + 0 30 33
28	11	41.6	5.1 + 9 22 46	28	11	41.0	6.9 + 1 03 29
4 5	11	36.5	+10 08	4 5	11	34.1	+ 1 32
			14 <sup>m</sup> 5				15 <sup>m</sup> 3
			177°				145°
			0.525				0.451
			-24'				-70'
			6 <sup>m</sup> 8				8 <sup>m</sup> 2
			0.373*				0.264*
			1				1
643 Scheherezade				441 Bathilde			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	03.3	4.7 -20 28 9	2 24	12	09.0	5.0 -13 43 17
3 4	11	58.6	5.4 -20 19 22	3 4	12	04.0	6.0 -13 26 30
12	11	53.2	5.7 -19 57 35	12 19	11	58.0	6.4 -12 56 42
20 18	11	47.5	5.6 -19 22 45	20 19	11	51.6	6.4 -12 14 49
28	11	41.9	5.2 -18 37 52	28	11	45.2	5.9 -11 25 54
4 5	11	36.7	-17 45	4 5	11	39.3	-10 31
			13 <sup>m</sup> 7				12 <sup>m</sup> 5
			66°				79°
			0.510				0.444
			-4.9				-5.5
			0.359				0.256
			2				2
66 Maja				436 Patricia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	07.6	6.0 + 0 35 33	2 24	12	11.2	5.8 - 2 58 1
3 4	12	01.6	6.7 + 1 08 38	3 4	12	05.4	6.4 - 2 57 6
12	11	54.9	7.1 + 1 46 37	12 19	11	59.0	6.9 - 2 51 8
20 18	11	47.8	6.9 + 2 23 37	20 19	11	52.1	6.9 - 2 43 11
28	11	40.9	6.3 + 3 00 32	28	11	45.2	6.5 - 2 32 10
4 5	11	34.6	+ 3 32	4 5	11	38.7	- 2 22
			12 <sup>m</sup> 6				13 <sup>m</sup> 3
			110°				172°
			0.456				0.535
			-63'				-68'
			8 <sup>m</sup> 5				5 <sup>m</sup> 1
			0.272*				0.388
			1				1
1312 Vassar				1122 Neith			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> /
2 24	12	04.7	4.7 +19 59 73	2 24	12	12.0	6.0 + 5 43 43
3 4	12	00.0	5.8 +21 12 67	3 4	12	06.0	6.7 + 6 26 44
12	11	54.2	5.8 +22 19 58	12 19	11	59.3	7.0 + 7 10 42
20 19	11	48.4	5.7 +23 17 47	20 19	11	52.3	6.9 + 7 52 37
28	11	42.7	5.2 +24 04 34	28	11	45.4	6.4 + 8 29 29
4 5	11	37.5	+24 38	4 5	11	39.0	+ 8 58
			16 <sup>m</sup> 7				15 <sup>m</sup> 5
			125°				125°
			0.552				0.489
			-2.0				-6.7
			0.418*				0.325
			6				13

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1065 Amundsenia 16 <sup>m</sup> 0				1348 Michel 13 <sup>m</sup> 2			
3	4	12 09.6 7.4 - 7 13 20	244°	2	24	12 16.8 5.2 + 9 16 52	56°
	12	12 02.2 8.0 - 6 53 29	0.448	3	4	12 11.6 6.0 +10 08 50	0.418
	20	11 54.2 8.3 - 6 24 34	-72'		12	12 05.6 6.7 +10 58 45	-6.8
	28	11 45.9 7.9 - 5 50 37	7 <sup>m</sup> 7	20	20	11 58.9 6.7 +11 43 37	
4	5	11 38.0 7.0 - 5 13 36	0.259	28	11 52.2 6.0 +12 20 26	0.214	
	13	11 31.0 - 4 37 1	1	4	5	11 46.2 +12 46 13	13
1554 1940 RE 15 <sup>m</sup> 3				1247 Memoria 14 <sup>m</sup> 5			
3	4	12 08.1 5.8 -12 37 44	199°	3	4	12 08.9 5.3 - 0 22 38	260°
	12	12 02.3 6.3 -11 53 55	0.495		12	12 03.6 5.7 + 0 16 42	0.520
	20	11 56.0 6.4 -10 58 62	-3.0	20	21	11 57.9 5.9 + 0 58 41	-40'
	28	11 49.6 6.0 - 9 56 65		28	11 52.0 5.6 + 1 39 39	6 <sup>m</sup> 6	
4	5	11 43.6 5.4 - 8 51 66	0.331	4	5	11 46.4 5.0 + 2 18 35	0.365
	13	11 38.2 - 7 45 5*	5*	13	11 41.4 + 2 53 1	1*	
924 Toni 13 <sup>m</sup> 5				1469 Linzia 14 <sup>m</sup> 1			
3	4	12 07.3 5.4 + 4 47 54	165°	3	4	12 09.4 4.9 - 5 16 56	143°
	12	12 01.9 5.7 + 5 41 54	0.530		12	12 04.5 5.3 - 4 20 60	0.516
	20	11 56.2 5.8 + 6 35 50	-27'	20	21	11 59.2 5.3 - 3 20 63	-19'
	28	11 50.4 5.4 + 7 25 45	6 <sup>m</sup> 3	28	11 53.9 5.1 - 2 17 63	7 <sup>m</sup> 3	
4	5	11 45.0 4.8 + 8 10 37	0.380	4	5	11 48.8 4.4 - 1 14 58	0.359
	13	11 40.2 + 8 47 1	1*	13	11 44.4 - 0 16 1	1*	
1258 Sicilia 14 <sup>m</sup> 6				682 Hagar 15 <sup>m</sup> 0			
3	4	12 08.3 5.5 -10 50 18	195°	3	4	12 11.6 5.4 - 6 13 61	268°
	12	12 02.8 6.0 -10 32 25	0.525		12	12 06.2 6.2 - 5 12 70	0.437
	20	11 56.8 6.0 -10 07 32	-48'	20	21	12 00.0 6.2 - 4 02 75	-33'
	28	11 50.8 5.8 - 9 35 34	6 <sup>m</sup> 4	28	11 53.8 6.0 - 2 47 75	10 <sup>m</sup> 3	
4	5	11 45.0 5.0 - 9 01 35	0.374	4	5	11 47.8 5.3 - 1 32 72	0.241
	13	11 40.0 - 8 26 1	1	13	11 42.5 - 0 20 1	1	
1066 Lobelia 15 <sup>m</sup> 9				1522 1938 WO 15 <sup>m</sup> 8			
2	24	12 13.8 6.2 - 2 41 27	177°	3	4	12 15.3 7.0 + 7 29 46	80°
3	4	12 07.6 7.0 - 2 14 33	0.462		12	12 08.3 7.8 + 8 15 42	0.371
	12	12 00.6 7.5 - 1 41 36	-62'	20	21	12 00.5 7.7 + 8 57 34	-7.2
	20	11 53.1 7.6 - 1 05 37	7 <sup>m</sup> 5	28	11 52.8 7.1 + 9 31 24		
	28	11 45.5 7.0 - 0 28 37	0.280	4	5	11 45.7 5.9 + 9 55 12	0.133
4	5	11 38.5 + 0 09 1	1*	13	11 39.8 +10 07 12	12*	
1483 1938 DI <sub>1</sub> 14 <sup>m</sup> 7				627 Charis 13 <sup>m</sup> 3			
2	24	12 12.1 4.8 + 7 05 42	10°	3	4	12 12.0 5.4 + 4 10 53	222°
3	4	12 07.3 6.0 + 7 47 43	0.351		12	12 06.6 6.0 + 5 03 53	0.482
	12	12 01.3 6.6 + 8 30 39	-6.8	20	21	12 00.6 5.9 + 5 56 51	-40'
	20	11 54.7 6.6 + 9 09 31		28	11 54.7 5.7 + 6 47 45	8 <sup>m</sup> 3	
	28	11 48.1 5.8 + 9 40 19	0.095	4	5	11 49.0 5.0 + 7 32 36	0.309
4	5	11 42.3 + 9 59 12	12*	13	11 44.0 + 8 08 1	1	

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
1470 1938 SD				1456 1937 NG					
	h	m	°		h	m	°		
3	4	12 12.0	5.4 - 1 04 29	220°	3	4	12 18.0	5.2 -16 59 14	224°
	12	12 06.6	5.9 - 0 35 31	0.524		12	12 12.8	5.8 -16 45 23	0.577
	20	12 00.7	5.9 - 0 04 32	-49'		20	12 07.0	5.9 -16 22 30	-35'
	28	11 54.8	5.8 + 0 28 31	6 <sup>m</sup> 4		28	12 01.1	5.7 -15 52 37	4 <sup>m</sup> 8
4	5	11 49.0	5.0 + 0 59 27	0.370	4	5	11 55.4	5.4 -15 15 41	0.449
	13	11 44.0	+ 1 26	1		13	11 50.0	-14 34	1
901 Brunzia				584 Semiramis					
	h	m	°		h	m	°		
3	4	12 18.1	6.9 - 7 46 37	225°	3	4	12 21.3	6.7 -18 55 15	180°
	12	12 11.2	7.7 - 7 09 46	0.418		12	12 14.6	7.5 -18 40 28	0.466
	20	12 03.5	8.0 - 6 23 52	-63'		20	12 07.1	7.7 -18 12 40	-54'
	28	11 55.5	7.7 - 5 31 54	9 <sup>m</sup> 9		28	11 59.4	7.4 -17 32 50	7 <sup>m</sup> 8
4	5	11 47.8	6.8 - 4 37 53	0.212*	4	5	11 52.0	6.7 -16 42 55	0.294*
	13	11 41.0	- 3 44	1		13	11 45.3	-15 47	1
570 Kythera				157 Dejanira					
	h	m	°		h	m	°		
3	4	12 14.4	4.9 - 3 26 31	153°	3	4	12 22.6	7.3 +19 37 41	48°
	12	12 09.5	5.2 - 2 55 35	0.576		12	12 15.3	8.0 +20 18 26	0.361
	20	12 04.3	5.3 - 2 20 37	-6.0		20	12 07.3	7.9 +20 44 10	-115'
	28	11 59.0	5.1 - 1 43 36			28	11 59.4	7.3 +20 54 10	15 <sup>m</sup> 2
4	5	11 53.9	4.6 - 1 07 33	0.444	4	5	11 52.1	5.9 +20 44 27	0.126*
	13	11 49.3	- 0 34	2		13	11 46.2	+20 17	1
1286 Banachiewicza				53 Kalypso					
	h	m	°		h	m	°		
3	4	12 16.3	5.0 - 7 28 46	246°	3	4	12 20.7	6.0 + 2 28 61	63°
	12	12 11.3	5.5 - 6 42 52	0.499		12	12 14.7	6.7 + 3 29 62	0.392
	20	12 05.8	5.7 - 5 50 57	-3.9		20	12 08.0	6.6 + 4 31 58	-68'
	28	12 00.1	5.5 - 4 53 59			28	12 01.4	6.2 + 5 29 49	13 <sup>m</sup> 0
4	5	11 54.6	4.8 - 3 54 56	0.354	4	5	11 55.2	5.2 + 6 18 38	0.169*
	13	11 49.8	- 2 58	13		13	11 50.0	+ 6 56	1
1432 1937 PG				568 Cheruskia					
	h	m	°		h	m	°		
3	4	12 19.3	6.3 + 8 28 64	207°	3	4	12 21.5	5.6 -27 38 17	109°
	12	12 13.0	7.1 + 9 32 62	0.459		12	12 15.9	6.3 -27 21 34	0.492
	20	12 05.9	7.2 +10 34 55	-5.0		20	12 09.6	6.5 -26 47 48	-3.6
	28	11 58.7	6.9 +11 29 47			28	12 03.1	6.2 -25 59 62	
4	5	11 51.8	6.1 +12 16 34	0.278*	4	5	11 56.9	5.5 -24 57 70	0.338
	13	11 45.7	+12 50	5		13	11 51.4	-23 47	2
416 Vaticana				1378 Leonce					
	h	m	°		h	m	°		
3	4	12 21.2	6.5 +18 30 45	305°	3	4	12 23.5	6.2 + 2 41 37	311°
	12	12 14.7	7.4 +19 15 36	0.405		12	12 17.3	7.3 + 3 18 39	0.337
	20	12 07.3	7.7 +19 51 22	-7.5		20	12 10.0	7.8 + 3 57 37	-7.3
	28	11 59.6	7.5 +20 13 6			28	12 02.2	7.4 + 4 34 31	
4	5	11 52.1	6.5 +20 19 11	0.201	4	5	11 54.8	6.7 + 5 05 21	0.073
	13	11 45.6	+20 08	2		13	11 48.1	+ 5 26	13

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
423 Diotima 11 <sup>m</sup> 2				1201 Strenua 14 <sup>m</sup> 4			
3	4	12 23.0 5.6 +14 46 43	265°	3	4	12 30.4 5.2 - 7 43 45	178°
	12	12 17.4 6.2 +15 29 37	0.489		12	12 25.2 5.9 - 6 58 54	0.447
	20	12 11.2 6.5 +16 06 28	-6.0		20	12 19.3 6.3 - 6 04 58	-4.5
	28	12 04.7 6.2 +16 34 18			28	12 13.0 6.1 - 5 06 61	
4	5	11 58.5 5.5 +16 52 6	0.325	4	5	12 06.9 5.5 - 4 05 58	0.257
	13	11 53.0 +16 58	2*		13	12 01.4 - 3 07	5
1255 Schilowa 15 <sup>m</sup> 2				1529 1938 BC 16 <sup>m</sup> 6			
3	4	12 21.4 4.9 -12 30 28	180°	3	4	12 23.2 4.2 + 9 35 36	117°
	12	12 16.5 5.4 -12 02 37	0.568		12	12 19.0 4.6 +10 11 35	0.650
	20	12 11.1 5.6 -11 25 42	-26'		20	12 14.4 4.8 +10 46 31	-6.0
	28	12 05.5 5.5 -10 43 45	5 <sup>m</sup> 3		28	12 09.6 4.6 +11 17 26	
4	5	12 00.0 4.9 - 9 58 47	0.435	4	5	12 05.0 4.2 +11 43 20	0.541
	13	11 55.1 - 9 11	1		13	12 00.8 +12 03	2*
374 Burgundia 11 <sup>m</sup> 4				538 Friederike 14 <sup>m</sup> 0			
3	4	12 23.5 5.0 -12 07 40	309°	3	4	12 29.2 4.8 + 2 35 44	184°
	12	12 18.5 5.8 -11 27 52	0.423		12	12 24.4 5.2 + 3 19 44	0.567
	20	12 12.7 6.1 -10 35 60	-4.3		20	12 19.2 5.5 + 4 03 44	-26'
	28	12 06.6 5.9 - 9 35 66			28	12 13.7 5.4 + 4 47 40	5 <sup>m</sup> 3
4	5	12 00.7 5.3 - 8 29 67	0.222	4	5	12 08.3 5.0 + 5 27 35	0.431
	13	11 55.4 - 7 22	2		13	12 03.3 + 6 02	1
724 Hapag 16 <sup>m</sup> 3				617 Patroclus 13 <sup>m</sup> 3			
3	4	12 30.1 6.0 -10 53 57	114°	3	4	12 27.9 3.8 +18 46 22	190°
	12	12 24.1 6.7 - 9 56 66	0.444		12	12 24.1 4.1 +19 08 19	0.773
	20	12 17.4 7.0 - 8 50 73	-30'		20	12 20.0 4.2 +19 27 14	-12.0
	28	12 10.4 6.6 - 7 37 76	9 <sup>m</sup> 4		28	12 15.8 4.1 +19 41 9	
4	5	12 03.8 5.9 - 6 21 73	0.255	4	5	12 11.7 3.9 +19 50 2	0.700
	13	11 57.9 - 5 08	1		13	12 07.8 +19 52	2
644 Cosima 13 <sup>m</sup> 9				1198 Atlantis 18 <sup>m</sup> 3			
3	4	12 30.5 5.8 - 1 44 40	162°	3	4	12 34.4 6.4 - 7 57 35	222°
	12	12 24.7 6.5 - 1 04 44	0.476		12	12 28.0 7.3 - 7 22 44	0.462
	20	12 18.2 6.8 + 0 20 44	-50'		20	12 20.7 7.8 - 6 38 51	-47'
	28	12 11.4 6.6 + 0 24 43	7 <sup>m</sup> 7		28	12 12.9 7.8 - 5 47 52	7 <sup>m</sup> 5
4	5	12 04.8 6.0 + 1 07 38	0.300	4	5	12 05.1 7.2 - 4 55 53	0.281
	13	11 58.8 + 1 45	1*		13	11 57.9 - 4 02	1
42 Isis 11 <sup>m</sup> 3				230 Athamantis 10 <sup>m</sup> 7			
3	4	12 32.2 6.2 +10 29 56	238°	3	4	12 33.7 5.4 -17 07 27	168°
	12	12 26.0 7.0 +11 25 53	0.449		12	12 28.3 6.7 -16 40 44	0.403
	20	12 19.0 7.6 +12 18 46	-55'		20	12 21.6 7.2 -15 56 57	-4.6
	28	12 11.4 7.3 +13 04 37	8 <sup>m</sup> 7		28	12 14.4 7.0 -14 59 67	
4	5	12 04.1 6.8 +13 41 24	0.263	4	5	12 07.4 6.3 -13 52 72	0.190
	13	11 57.3 +14 05	1*		13	12 01.1 -12 40	2*

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
917 Lyka				511 Davida			
			14 <sup>m</sup> 5				9 <sup>m</sup> 7
3	4	12 36.0	6.3	3	12	12 39.6	5.6
	12	12 29.7	7.2		20	12 34.0	5.9
	20	12 22.5	7.8		28	12 28.1	5.9
	28	12 14.7	7.7	4	5	12 22.2	5.5
4	5	12 07.0	7.0		13	12 16.7	4.7
	13	12 00.0			21	12 12.0	
			214°				+18 45
			0.448				+19 40
			-66'				+20 24
			8 <sup>m</sup> 3				+20 56
			0.260*				+21 14
			1*				+21 19
							85°
							0.510
							-37'
							7 <sup>m</sup> 6
							0.360*
							1*
278 Paulina				385 Ilmatar			
			12 <sup>m</sup> 0				9 <sup>m</sup> 6
3	4	12 39.1	5.3	3	12	12 43.4	7.1
	12	12 33.8	6.4		20	12 36.3	8.0
	20	12 27.4	7.0		28	12 28.3	8.0
	28	12 20.4	7.0	4	5	12 20.3	7.5
4	5	12 13.4	6.2		13	12 12.8	6.5
	13	12 07.2			21	12 06.3	
			346°				-12 50
			0.381				-13 06
			-7.6				-13 12
							-13 09
							-13 01
							-12 50
			0.153*				13°
			2*				0.399
							-9.8
							0.180*
							2*
217 Eudora				929 Algunde			
			13 <sup>m</sup> 8				13 <sup>m</sup> 3
3	4	12 39.7	4.8	3	12	12 41.8	6.2
	12	12 34.9	5.6		20	12 35.6	7.2
	20	12 29.3	6.1		28	12 28.4	7.4
	28	12 23.2	6.0	4	5	12 21.0	6.9
4	5	12 17.2	5.9		13	12 14.1	5.7
	13	12 11.3			21	12 08.4	
			260°				-10 15
			0.514				-9 31
			-3.6				-8 36
							-7 33
							-6 28
							-5 26
			0.357*				307°
			2*				0.324
							-107'
							18 <sup>m</sup> 6
							0.046*
							1*
1486 Marilyn				1291 Phryne			
			15 <sup>m</sup> 6				13 <sup>m</sup> 8
3	4	12 39.7	7.2	3	12	12 40.2	5.1
	12	12 32.5	7.9		20	12 35.1	5.7
	20	12 24.6	8.0		28	12 29.4	5.8
	28	12 16.6	7.5	4	5	12 23.6	5.5
4	5	12 09.1	6.4		13	12 18.1	4.8
	13	12 02.7			21	12 13.3	
			235°				-11 15
			0.376				-10 33
			-6.5				-9 44
							-8 50
							-7 54
							-7 00
			0.139				229°
			13				0.507
							-4.3
							0.347
							13
1485 Isa				1530 1938 SG			
			15 <sup>m</sup> 5				17 <sup>m</sup> 7
3	4	12 41.4	5.4	3	12	12 44.6	7.1
	12	12 36.0	5.9		20	12 37.5	7.8
	20	12 30.1	6.2		28	12 29.7	7.9
	28	12 23.9	6.4	4	5	12 21.8	7.4
4	5	12 17.5	5.9		13	12 14.4	6.6
	13	12 11.6			21	12 07.8	
			-16 38				-12 02
			-16 31				-11 29
			-16 14				-10 47
			-15 48				-9 58
			-15 14				-9 06
			-14 36				-8 16
			220°				180°
			0.520				0.431
			-47'				-6.5
			6 <sup>m</sup> 6				0.232*
			0.368*				12
			7*				
1496 1938 SA <sub>1</sub>				1549 Mikko			
			16 <sup>m</sup> 2				15 <sup>m</sup> 2
3	4	12 44.3	5.7	3	12	12 45.3	7.2
	12	12 38.6	7.1		20	12 38.1	7.9
	20	12 31.5	8.0		28	12 30.2	7.9
	28	12 23.5	8.2	4	5	12 22.3	7.1
4	5	12 15.3	7.7		13	12 15.2	5.9
	13	12 07.6			21	12 09.3	
			-8 53				+5 47
			-8 30				+6 40
			-7 56				+7 29
			-7 13				+8 08
			-6 24				+8 34
			-5 34				+8 46
			272°				85°
			0.352				0.349
			-6.7				-6.8
							0.095*
			0.098*				12*
			12*				



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1333 Cevenola 14 <sup>m</sup> 7				551 Ortrud 13 <sup>m</sup> 1			
3	12	12 44.1	6.2 +17 51 72	3	12	12 46.4	5.7 - 4 56 34
	20	12 37.9	6.7 +19 03 58		20	12 40.7	6.1 - 4 22 38
	28	12 31.2	6.7 +20 01 42		28	12 34.6	6.2 - 3 44 39
4	5	12 24.5	6.1 +20 43 24	4	5	12 28.4	5.9 - 3 05 36
	13	12 18.4	5.1 +21 07 4		13	12 22.5	5.2 - 2 29 33
	21	12 13.3	+21 11 3		21	12 17.3	- 1 56 1
1208 Troilus 15 <sup>m</sup> 3				80 Sappho 11 <sup>m</sup> 6			
3	12	12 41.5	4.8 +33 02 18	3	12	12 48.5	6.3 -12 49 50
	20	12 36.7	5.0 +33 20 10		20	12 42.2	7.1 -11 59 60
	28	12 31.7	5.1 +33 30 1		28	12 35.1	7.3 -10 59 66
4	5	12 26.6	4.8 +33 31 7	4	5	12 27.8	7.0 - 9 53 69
	13	12 21.8	4.4 +33 24 17		13	12 20.8	6.2 - 8 44 68
	21	12 17.4	+33 07 2		21	12 14.6	- 7 36 1
358 Apollonia 12 <sup>m</sup> 8				1498 1938 SK <sub>1</sub> 17 <sup>m</sup> 9			
3	12	12 42.9	5.7 - 3 31 45	3	12	12 48.6	5.2 -22 28 18
	20	12 37.2	6.1 - 2 46 47		20	12 43.4	5.8 -22 10 28
	28	12 31.1	6.1 - 1 59 48		28	12 37.6	5.9 -21 42 37
4	5	12 25.0	5.8 - 1 11 43	4	5	12 31.7	5.8 -21 05 43
	13	12 19.2	5.0 - 0 28 39		13	12 25.9	5.3 -20 22 49
	21	12 14.2	+ 0 11 1		21	12 20.6	-19 33 12
603 Timandra 13 <sup>m</sup> 1				733 Mocia 12 <sup>m</sup> 8			
3	12	12 49.0	7.1 -10 32 0	3	12	12 55.5	6.4 -21 21 20
	20	12 41.9	7.9 -10 32 8		20	12 49.1	7.0 -21 41 10
	28	12 34.0	8.0 -10 24 16		28	12 42.1	7.3 -21 51 0
4	5	12 26.0	7.5 -10 08 19	4	5	12 34.8	7.1 -21 51 10
	13	12 18.5	6.2 - 9 49 20		13	12 27.7	6.6 -21 41 16
	21	12 12.3	- 9 29 1		21	12 21.1	-21 25 2
1310 Villigera 13 <sup>m</sup> 5				1162 Larissa 13 <sup>m</sup> 6			
3	12	12 56.6	10.8 -11 32 29	3	12	12 51.6	4.4 - 4 01 26
	20	12 45.8	11.5 -12 01 19		20	12 47.2	4.8 - 3 35 29
	28	12 34.3	11.3 -12 20 7		28	12 42.4	5.0 - 3 06 29
4	5	12 23.0	10.2 -12 27 1	4	5	12 37.4	4.9 - 2 37 28
	13	12 12.8	8.7 -12 28 3		13	12 32.5	4.5 - 2 09 26
	21	12 04.1	-12 25 5		21	12 28.0	- 1 43 2
413 Edburga 13 <sup>m</sup> 9				599 Luisa 13 <sup>m</sup> 5			
3	12	12 47.5	6.3 +22 04 60	3	12	12 56.2	6.4 +11 00 34
	20	12 41.2	6.8 +23 04 49		20	12 49.8	6.9 +11 34 28
	28	12 34.4	6.9 +23 53 37		28	12 42.9	7.1 +12 02 23
4	5	12 27.5	6.6 +24 30 22	4	5	12 35.8	7.0 +12 25 13
	13	12 20.9	6.0 +24 52 8		13	12 28.8	6.6 +12 38 3
	21	12 14.9	+25 00 1		21	12 22.2	+12 41 1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1102 Pepita				679 Pax			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	12	53.8	4.8 -16 35 43	3 12	13	05.6	6.2 +27 22 70
20	12	49.0	5.4 -15 52 53	20	12	59.4	6.8 +28 32 57
28	12	43.6	5.6 -14 59 60	28	12	52.6	7.1 +29 29 41
4 5	12	38.0	5.5 -13 59 65	4 5	12	45.5	6.9 +30 10 24
13	12	32.5	5.0 -12 54 67	13	12	38.6	6.4 +30 34 6
21	12	27.5	-11 47 5	21	12	32.2	+30 40 1
1517 1938 FD				170 Maria			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	12	56.4	5.8 +1 32 38	3 12	13	07.6	6.4 -29 25 20
20	12	50.6	6.6 +2 10 37	20	13	01.2	7.5 -29 45 2
28	12	44.0	6.9 +2 47 35	28	12	53.7	8.1 -29 47 17
4 5	12	37.1	6.7 +3 22 28	4 5	12	45.6	8.0 -29 30 34
13	12	30.4	6.0 +3 50 20	13	12	37.6	7.4 -28 56 48
21	12	24.4	+4 10 5	21	12	30.2	-28 08 1
610 Valeska				49 Pales			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	12	58.3	5.5 -2 04 21	3 12	13	03.2	5.0 -11 13 26
20	12	52.8	6.0 -1 43 23	20	12	58.2	5.6 -10 47 31
28	12	46.8	6.2 -1 20 22	28	12	52.6	5.8 -10 16 35
4 5	12	40.6	6.1 -0 58 21	4 5	12	46.8	5.8 -9 41 37
13	12	34.5	5.7 -0 37 17	13	12	41.0	5.4 -9 04 36
21	12	28.8	-0 20 1	21	12	35.6	-8 28 1
1506 1939 IC				448 Natalie			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	13	00.1	4.7 -22 16 28	3 12	13	04.4	5.4 +3 04 25
20	12	55.4	6.1 -21 48 47	20	12	59.0	6.1 +3 29 25
28	12	49.3	6.7 -21 01 66	28	12	52.9	6.3 +3 54 22
4 5	12	42.6	6.8 -19 55 82	4 5	12	46.6	6.4 +4 16 17
13	12	35.8	6.2 -18 33 92	13	12	40.2	5.9 +4 33 12
21	12	29.6	-17 01 5	21	12	34.3	+4 45 1
1421 1936 FQ				328 Gudrun			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	13	03.0	5.5 +3 04 24	3 12	13	07.5	6.1 -15 16 9
20	12	57.5	6.4 +3 28 23	20	13	01.4	6.8 -15 25 0
28	12	51.1	6.7 +3 51 19	28	12	54.6	7.3 -15 25 8
4 5	12	44.4	6.5 +4 10 13	4 5	12	47.3	7.2 -15 17 12
13	12	37.9	6.0 +4 23 5	13	12	40.1	6.7 -15 05 16
21	12	31.9	+4 28 12	21	12	33.4	-14 49 1
1070 Tunica				1519 1938 UB			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
3 12	13	00.9	4.3 +2 41 65	3 12	13	07.0	5.3 -5 07 17
20	12	56.6	5.0 +3 46 64	20	13	01.7	5.9 -4 50 20
28	12	51.6	5.2 +4 50 62	28	12	55.8	6.2 -4 30 22
4 5	12	46.4	5.2 +5 52 57	4 5	12	49.6	6.2 -4 08 21
13	12	41.2	4.8 +6 49 49	13	12	43.4	5.9 -3 47 19
21	12	36.4	+7 38 1	21	12	37.5	-3 28 12

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
676 Melitta				1372 Haremari			
	h	m	°		h	m	°
3 20	13	02.9	5.2 + 5 17 60	3 20	13	13.5	7.2 -27 22 6
28	12	57.7	5.5 + 6 17 56	28	13	06.3	7.7 -27 28 7
4 5	12	52.2	5.6 + 7 13 49	4 5	12	58.6	7.9 -27 21 19
13	12	46.6	5.2 + 8 02 42	13	12	50.7	7.5 -27 02 30
21	12	41.4	4.6 + 8 44 30	21	12	43.2	6.6 -26 32 38
29	12	36.8	+ 9 14 1	29	12	36.6	-25 54 1
			13 <sup>m</sup> 0				15 <sup>m</sup> 3
			232°				138°
			0.523				0.490
			-23'				-66'
			6 <sup>m</sup> 8				7 <sup>m</sup> 3
			0.371*				0.331
			1*				1
920 Rogeria				1104 Syringa			
	h	m	°		h	m	°
3 12	13	08.4	4.9 - 8 53 66	3 20	13	12.1	6.3 + 0 58 50
20	13	03.5	5.7 - 7 47 75	28	13	05.8	6.7 + 1 48 48
28	12	57.8	6.2 - 6 32 78	4 5	12	59.1	6.6 + 2 36 43
4 5	12	51.6	6.1 - 5 14 77	13	12	52.5	6.2 + 3 19 37
13	12	45.5	5.5 - 3 57 71	21	12	46.3	5.5 + 3 56 27
21	12	40.0	- 2 46 1	29	12	40.8	+ 4 23 1
			13 <sup>m</sup> 3				16 <sup>m</sup> 6
			82°				123°
			0.417				0.517
			-35'				-34'
			11 <sup>m</sup> 7				6 <sup>m</sup> 0
			0.208*				0.361*
			1*				1*
1417 Walinskia				960 Birgit			
	h	m	°		h	m	°
3 12	13	13.0	4.9 + 5 26 46	3 20	13	13.7	6.9 -12 11 41
20	13	08.1	5.7 + 6 12 44	28	13	06.8	7.6 -11 30 49
28	13	02.4	6.1 + 6 56 39	4 5	12	59.2	7.9 -10 41 55
4 5	12	56.3	6.3 + 7 35 31	13	12	51.3	7.5 - 9 46 56
13	12	50.0	5.8 + 8 06 21	21	12	43.8	6.5 - 8 50 54
21	12	44.2	+ 8 27 7	29	12	37.3	- 7 56 1
			15 <sup>m</sup> 0				14 <sup>m</sup> 9
			301°				234°
			0.458				0.398
			-59'				-67'
			9 <sup>m</sup> 3				11 <sup>m</sup> 6
			0.275*				0.177*
			7*				1*
148 Gallia				1082 Pirola			
	h	m	°		h	m	°
3 20	13	07.4	5.7 +18 44 81	3 20	13	10.6	5.2 - 5 37 36
28	13	01.7	6.1 +20 05 70	28	13	05.4	5.7 - 5 01 39
4 5	12	55.6	6.0 +21 15 55	4 5	12	59.7	5.8 - 4 22 39
13	12	49.6	5.5 +22 10 38	13	12	53.9	5.6 - 3 43 36
21	12	44.1	4.9 +22 48 22	21	12	48.3	5.0 - 3 07 32
29	12	39.2	+23 10 1	29	12	43.3	- 2 35 1
			11 <sup>m</sup> 8				14 <sup>m</sup> 5
			143°				238°
			0.507				0.542
			-9'				-33'
			7 <sup>m</sup> 4				5 <sup>m</sup> 9
			0.360*				0.395
			1*				1
1337 Gerarda				455 Bruchsalia			
	h	m	°		h	m	°
3 20	13	07.8	5.2 + 6 11 74	3 20	13	14.8	6.3 + 9 07 43
28	13	02.6	5.6 + 7 25 70	28	13	08.5	6.8 + 9 50 37
4 5	12	57.0	5.7 + 8 35 62	4 5	13	01.7	6.9 +10 27 30
13	12	51.3	5.3 + 9 37 52	13	12	54.8	6.6 +10 57 20
21	12	46.0	4.6 +10 29 41	21	12	48.2	6.0 +11 17 9
29	12	41.4	+11 10 1	29	12	42.2	+11 26 1
			14 <sup>m</sup> 9				12 <sup>m</sup> 8
			195°				221°
			0.505				0.521
			-15'				-42'
			7 <sup>m</sup> 5				5 <sup>m</sup> 6
			0.346				0.371*
			1				1*
694 Ekard				980 Anacostia			
	h	m	°		h	m	°
3 20	13	10.2	6.0 -21 12 42	3 20	13	16.2	6.4 -31 42 5
28	13	04.2	6.5 -20 30 53	28	13	09.8	7.1 -31 37 21
4 5	12	57.7	6.7 -19 37 63	4 5	13	02.7	7.3 -31 16 34
13	12	51.0	6.4 -18 34 69	13	12	55.4	7.1 -30 42 47
21	12	44.6	5.8 -17 25 72	21	12	48.3	6.4 -29 55 56
29	12	38.8	-16 13 1	29	12	41.9	-28 59 1
			13 <sup>m</sup> 4				11 <sup>m</sup> 8
			245°				221°
			0.508				0.505
			-20'				-43'
			7 <sup>m</sup> 0				7 <sup>m</sup> 6
			0.350				0.356
			1				1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
167 Urda				362 Havnia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	17.3	5.5 - 6 35 40	3 20	13	26.0	6.6 - 5 34 20
28	13	11.8	6.1 - 5 55 44	28	13	19.4	7.4 - 5 14 21
4 5	13	05.7	6.3 - 5 11 44	4 5	13	12.0	7.6 - 4 53 22
13	12	59.4	6.0 - 4 27 41	13	13	04.4	7.4 - 4 31 19
21	12	53.4	5.2 - 3 46 37	21	12	57.0	6.6 - 4 12 14
29	12	48.2	-	29	12	50.4	-
			1				1
186 Celuta				427 Galene			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	22.2	7.7 - 7 48 4	3 20	13	24.0	5.4 - 16 35 19
28	13	14.5	8.7 - 7 44 9	28	13	18.6	6.2 - 16 16 27
4 5	13	05.8	8.9 - 7 35 11	4 5	13	12.4	6.5 - 15 49 34
13	12	56.9	8.7 - 7 24 11	13	13	05.9	6.3 - 15 15 39
21	12	48.2	7.8 - 7 13 8	21	12	59.6	5.9 - 14 36 40
29	12	40.4	-	29	12	53.7	-
			1				2
522 Helga				678 Fredegundis			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	17.5	4.6 - 2 08 34	3 20	13	26.2	6.2 - 18 19 26
28	13	12.9	4.9 - 1 34 35	28	13	20.0	6.9 - 17 53 34
4 5	13	08.0	5.1 - 0 59 32	4 5	13	13.1	7.1 - 17 19 42
13	13	02.9	4.9 - 0 27 29	13	13	06.0	6.8 - 16 37 47
21	12	58.0	4.5 + 0 02 25	21	12	59.2	6.2 - 15 50 48
29	12	53.5	-	29	12	53.0	-
			7				1
1077 Campanula				784 Pickeringia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	22.5	6.8 - 12 52 23	3 20	13	28.7	6.1 - 8 23 8
28	13	15.7	7.5 - 12 29 30	28	13	22.6	7.1 - 8 31 4
4 5	13	08.2	7.9 - 11 59 34	4 5	13	15.5	7.6 - 8 35 2
13	13	00.3	7.6 - 11 25 37	13	13	07.9	7.6 - 8 37 2
21	12	52.7	6.8 - 10 48 37	21	13	00.3	6.9 - 8 39 3
29	12	45.9	-	29	12	53.4	-
			1				1
244 Sita				463 Lola			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	23.8	6.7 - 10 10 48	3 20	13	31.3	7.1 - 1 01 23
28	13	17.1	7.7 - 9 22 55	28	13	24.2	7.8 - 0 38 22
4 5	13	09.4	7.8 - 8 27 59	4 5	13	16.4	8.2 - 0 16 21
13	13	01.6	7.6 - 7 28 57	13	13	08.2	8.1 - 0 05 15
21	12	54.0	6.7 - 6 31 53	21	13	00.1	7.3 - 0 20 8
29	12	47.3	-	29	12	52.8	-
			1				1
959 Arne				1249 Rutherfordia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> <sup>'</sup>
3 20	13	21.4	5.1 - 4 02 30	3 20	13	32.0	6.2 - 17 50 30
28	13	16.3	5.5 - 3 32 32	28	13	25.8	7.2 - 17 20 45
4 5	13	10.8	5.7 - 3 00 31	4 5	13	18.6	7.8 - 16 35 55
13	13	05.1	5.5 - 2 29 27	13	13	10.8	7.5 - 15 40 63
21	12	59.6	5.1 - 2 02 24	21	13	03.3	6.5 - 14 37 63
29	12	54.5	-	29	12	56.8	-
			1				5

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
430 Hybris				71 Niobe			
	h m	° '			h m	° '	
3 20	13 31.8	5.7 -26 04	28 113°	3 28	13 43.4	8.4 -48 22	69 354°
28	13 26.1	6.4 -25 36	40 0.514	4 5	13 35.0	9.8 -49 31	41 0.358
4 5	13 19.7	6.6 -24 56	52 -2.6	13	13 25.2	10.5 -50 12	12 -130'
13	13 13.1	6.4 -24 04	60 20 <sup>m</sup> 7	21	13 14.7	9.9 -50 24	18 20 <sup>m</sup> 7
21	13 06.7	5.8 -23 04	64 0.362	29	13 04.8	8.4 -50 06	42 0.155*
29	13 00.9	-22 00	2	5 7	12 56.4	-49 24	1
1021 Flammario				681 Gorgo			
	h m	° '			h m	° '	
3 20	13 32.2	5.7 +13 16	57 135°	3 28	13 37.6	5.0 - 3 35	62 279°
28	13 26.5	6.3 +14 13	49 0.529	4 5	13 32.6	5.5 - 2 33	62 0.490
4 5	13 20.2	6.5 +15 02	38 -5.6	13	13 27.1	5.5 - 1 31	60 -21'
13	13 13.7	6.3 +15 40	27 8 <sup>m</sup> 3	21	13 21.6	5.2 - 0 31	52 8 <sup>m</sup> 3
21	13 07.4	5.8 +16 07	14 0.386*	29	13 16.4	4.5 + 0 21	44 0.321
29	13 01.6	+16 21	5	5 7	13 11.9	+ 1 05	1
1114 Lorraine				1460 1937 WC			
	h m	° '			h m	° '	
3 20	13 31.6	4.6 - 9 23	49 163°	3 28	13 43.8	6.8 - 1 33	37 114°
28	13 27.0	5.3 - 8 34	53 0.521	4 5	13 37.0	7.4 - 0 56	34 0.448
4 5	13 21.7	5.5 - 7 41	55 -21'	13	13 29.6	7.3 - 0 22	29 -7.4
13	13 16.2	5.5 - 6 46	55 7 <sup>m</sup> 1	21	13 22.3	6.8 + 0 07	21
21	13 10.7	5.0 - 5 51	50 0.366	29	13 15.5	5.9 + 0 28	12 0.259*
29	13 05.7	- 5 01	1	5 7	13 09.6	+ 0 40	12
1046 Edwin				303 Josephina			
	h m	° '			h m	° '	
3 20	13 38.4	5.5 -11 40	12 142°	3 28	13 42.9	5.8 -17 05	15 156°
28	13 32.9	6.3 -11 28	18 0.496	4 5	13 37.1	6.3 -16 50	21 0.517
4 5	13 26.6	6.7 -11 10	21 -60'	13	13 30.8	6.4 -16 29	26 -7.4
13	13 19.9	6.6 -10 49	22 7 <sup>m</sup> 1	21	13 24.4	6.1 -16 03	28
21	13 13.3	6.2 -10 27	22 0.331	29	13 18.3	5.4 -15 35	29 0.360
29	13 07.1	-10 05	1	5 7	13 12.9	-15 06	2
110 Lydia				1266 Tone			
	h m	° '			h m	° '	
3 28	13 35.5	6.4 - 3 47	31 229°	3 28	13 44.2	6.1 -33 46	10 282°
4 5	13 29.1	6.9 - 3 16	30 0.458	4 5	13 38.1	6.9 -33 56	3 0.526
13	13 22.2	6.8 - 2 46	27 -7.6	13	13 31.2	7.0 -33 53	16 -6.9
21	13 15.4	6.5 - 2 19	21	21	13 24.2	6.7 -33 37	27
29	13 08.9	5.4 - 1 58	14 0.277*	29	13 17.5	5.9 -33 10	36 0.384*
5 7	13 03.5	- 1 44	2	5 7	13 11.6	-32 34	2
115 Thyra				1117 Reginita			
	h m	° '			h m	° '	
3 20	13 43.0	6.7 -27 49	4 155°	3 28	13 44.9	6.3 - 4 35	60 289°
28	13 36.3	7.7 -27 53	12 0.449	4 5	13 38.6	7.4 - 3 35	63 0.341
4 5	13 28.6	8.4 -27 41	26 -61'	13	13 31.2	7.8 - 2 32	59 -82'
13	13 20.2	8.3 -27 15	39 9 <sup>m</sup> 2	21	13 23.4	7.4 - 1 33	52 16 <sup>m</sup> 4
21	13 11.9	7.7 -26 36	49 0.265*	29	13 16.0	6.4 - 0 41	39 0.077*
29	13 04.2	-25 47	1	5 7	13 09.6	- 0 02	1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
421 Zahringia 15 <sup>m</sup> 5				621 Werdandi 14 <sup>m</sup> 0			
3 28	13 45.7	6.1 — 8 14	159°	3 28	13 49.7	5.5 — 8 44	92°
4 5	13 39.6	6.6 — 7 23	0.511	4 5	13 44.2	6.0 — 8 14	0.504
13	13 33.0	6.6 — 6 29	-24'	13	13 38.2	6.1 — 7 42	-47'
21 15	13 26.4	6.3 — 5 37	6 <sup>m</sup> 4	21 17	13 32.1	5.9 — 7 11	7 <sup>m</sup> 3
29	13 20.1	5.6 — 4 47	0.350	29	13 26.2	5.2 — 6 41	0.341
5 7	13 14.5	— 4 04	1	5 7	13 21.0	— 6 17	1
1052 Belgica 13 <sup>m</sup> 7				880 Herba 16 <sup>m</sup> 1			
3 28	13 48.3	7.0 — 3 12	163°	3 28	13 51.3	5.7 — 29 07	231°
4 5	13 41.3	7.8 — 2 25	0.406	4 5	13 45.6	6.2 — 28 47	0.575
13	13 33.5	8.0 — 1 39	-6.2	13	13 39.4	6.4 — 28 17	-18'
21 15	13 25.5	7.5 — 0 58	0.190	21 17	13 33.0	6.3 — 27 37	5 <sup>m</sup> 4
29	13 18.0	6.2 — 0 25	13	29	13 26.7	5.8 — 26 49	0.447
5 7	13 11.8	— 0 02	13	5 7	13 20.9	— 25 56	1
1512 1939 FE 15 <sup>m</sup> 0				1231 Auricula 13 <sup>m</sup> 7			
3 28	13 44.0	4.9 — 12 44	321°	3 28	13 58.1	6.7 — 25 13	347°
4 5	13 39.1	5.3 — 12 31	0.542	4 5	13 51.4	7.8 — 25 35	0.388
13	13 33.8	5.7 — 12 14	-7.8	13	13 43.6	8.2 — 25 43	-7.6
21 16	13 28.1	5.3 — 11 55	0.395	21 17	13 35.4	8.2 — 25 38	0.166
29	13 22.8	4.9 — 11 35	2*	29	13 27.2	7.2 — 25 21	5
5 7	13 17.9	— 11 15	2*	5 7	13 20.0	— 24 56	5
457 Alleghenia 15 <sup>m</sup> 9				1394 1936 MD 13 <sup>m</sup> 8			
3 28	13 45.0	5.3 — 23 57	196°	3 28	13 56.0	4.8 — 10 08	283°
4 5	13 39.7	5.8 — 23 28	0.561	4 5	13 51.2	6.8 — 9 28	0.382
13	13 33.9	6.0 — 22 49	-20'	13	13 44.4	7.1 — 8 38	-5.1
21 16	13 27.9	5.7 — 22 04	5 <sup>m</sup> 9	21 17	13 37.3	7.0 — 7 48	0.149
29	13 22.2	5.2 — 21 13	1	29	13 30.3	6.1 — 6 59	5*
5 7	13 17.0	— 20 19	1	5 7	13 24.2	— 6 16	5*
425 Cornelia 12 <sup>m</sup> 8				923 Herluga 15 <sup>m</sup> 0			
3 28	13 48.0	5.8 — 6 38	17°	3 28	13 57.4	5.5 — 9 56	165°
4 5	13 42.2	6.4 — 6 10	0.435	4 5	13 51.9	6.1 — 8 53	0.494
13	13 35.8	6.6 — 5 40	-71'	13	13 45.8	6.4 — 7 47	-13'
21 16	13 29.2	6.4 — 5 12	10 <sup>m</sup> 4	21 18	13 39.4	6.2 — 6 40	7 <sup>m</sup> 6
29	13 22.8	5.4 — 4 48	0.236	29	13 33.2	5.6 — 5 36	0.326
5 7	13 17.4	— 4 31	1*	5 7	13 27.6	— 4 38	1
1336 Zeelandia 14 <sup>m</sup> 0				709 Fringilla 12 <sup>m</sup> 5			
3 28	13 48.8	5.6 — 6 16	257°	3 28	14 04.0	6.4 — 34 35	246°
4 5	13 43.2	6.3 — 5 40	0.463	4 5	13 57.6	7.3 — 34 54	0.489
13	13 36.9	6.5 — 5 03	-54'	13	13 50.3	7.9 — 34 59	-60'
21 16	13 30.4	6.2 — 4 28	8 <sup>m</sup> 8	21 19	13 42.4	7.9 — 34 50	8 <sup>m</sup> 7
29	13 24.2	5.6 — 3 56	0.280	29	13 34.5	7.3 — 34 26	0.334
5 7	13 18.6	— 3 31	1	5 7	13 27.2	— 33 52	1*



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
194 Prokne $10^m9$				788 Hohensteina $11^m9$					
3 28	14 03.9	5.1	+ 6 35 90	271°	3 28	14 07.9	4.0	- 3 25 76	350°
4 5	13 58.8	6.0	+ 8 05 86	0.441	4 5	14 03.9	4.8	- 2 09 76	0.434
13	13 52.8	6.4	+ 9 31 76	-15'	13	13 59.1	5.3	- 0 53 73	-25'
21 <sup>20</sup>	13 46.4	6.5	+10 47 62	10 <sup>m</sup> 1	21 <sup>21</sup>	13 53.8	5.3	+ 0 20 65	11 <sup>m</sup> 5
29	13 39.9	6.0	+11 49 47	0.255*	29	13 48.5	4.9	+ 1 25 55	0.237*
5 7	13 33.9		+12 36	1	5 7	13 43.6		+ 2 20	1
562 Salome $13^m2$				815 Coppelia $13^m6$					
3 28	14 05.3	5.5	+ 0 08 27	247°	3 28	14 15.4	6.4	- 0 19 15	86°
4 5	13 59.8	6.1	+ 0 35 26	0.501	4 5	14 09.0	7.3	- 0 04 12	0.425
13	13 53.7	6.5	+ 1 01 22	-57'	13	14 01.7	7.9	+ 0 08 7	-93'
21 <sup>20</sup>	13 47.2	6.5	+ 1 23 15	7 <sup>m</sup> 0	21 <sup>21</sup>	13 53.8	7.7	+ 0 15 0	9 <sup>m</sup> 6
29	13 40.7	6.0	+ 1 38 7	0.339	29	13 46.1	7.2	+ 0 15 10	0.223*
5 7	13 34.7		+ 1 45	1	5 7	13 38.9		+ 0 05	1
908 Buda $13^m3$				1180 Rita $14^m2$					
3 28	14 09.9		+ 8 29 39	80°	4 5	14 04.6	4.8	- 3 41 27	283°
4 5	14 03.2	7.6	+ 9 08 29	0.390	13	13 59.8	5.0	- 3 14 25	0.596
13	13 55.6	7.9	+ 9 37 16	-95'	21	13 54.8	5.1	- 2 49 22	-6.7
21 <sup>20</sup>	13 47.7	7.7	+ 9 53 0	12 <sup>m</sup> 1	29	13 49.7	4.9	- 2 27 18	
29	13 40.0	6.8	+ 9 53 15	0.172*	5 7	13 44.8	4.4	- 2 09 12	0.470
5 7	13 33.2		+ 9 38	1	15	13 40.4		- 1 57	2
1484 1938 HC $12^m6$				142 Polana $11^m3$					
4 5	14 06.6	7.4	+14 11 2	3°	4 5	14 10.4	6.1	-17 32 25	352°
13	13 59.2	8.1	+14 13 18	0.338	13	14 04.3	7.1	-17 07 36	0.322
21 <sup>21</sup>	13 51.1	7.8	+13 55 38	-143'	21	13 57.2	7.2	-16 31 41	-114'
29	13 43.3	7.0	+13 17 59	16 <sup>m</sup> 3	29	13 50.0	6.6	-15 50 43	20 <sup>m</sup> 3
5 7	13 36.3	5.7	+12 18 76	0.089*	5 7	13 43.4	5.4	-15 07 41	0.039*
15	13 30.6		+11 02	1	15	13 38.0		-14 26	1
542 Susanna $13^m4$				1339 Desagneauxa $13^m9$					
4 5	14 02.8	5.6	+ 1 37 53	207°	4 5	14 11.2	6.0	-26 13 18	117°
13	13 57.2	5.8	+ 2 30 49	0.516	13	14 05.2	6.5	-25 55 29	0.491
21 <sup>21</sup>	13 51.4	5.9	+ 3 19 42	-24'	21	13 58.7	6.6	-25 26 37	-4.4
29	13 45.5	5.5	+ 4 01 33	6 <sup>m</sup> 8	29	13 52.1	6.3	-24 49 44	
5 7	13 40.0	4.8	+ 4 34 22	0.362	5 7	13 45.8	5.4	-24 05 46	0.324
15	13 35.2		+ 4 56	1	15	13 40.4		-23 19	3
1022 1924 RT $12^m3$				796 Sarita $13^m4$					
3 28	14 09.3	5.0	+23 22 70	335°	4 5	14 14.5	7.3	-10 50 8	233°
4 5	14 04.3	6.2	+24 32 52	0.380	13	14 07.2	7.8	-10 42 10	0.516
13	13 58.1	6.7	+25 24 29	-5.1	21	13 59.4	8.0	-10 32 10	-62'
21 <sup>21</sup>	13 51.4	6.6	+25 53 4		29	13 51.4	7.8	-10 22 9	5 <sup>m</sup> 1
29	13 44.8	5.9	+25 57 22	0.180	5 7	13 43.6	7.2	-10 13 6	0.357
5 7	13 38.9		+25 35	2	15	13 36.4		-10 07	1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.					
468 Lina				117 Lomia								
	h	m	°		h	m	°					
4	5	14 12.0	5.4 -13 25	28	239°	4	5	14 25.1	6.6 -30 26	15	180°	
	13	14 06.6	5.9 -12 57	31	0.547		13	14 18.5	7.5 -30 41	4	0.486	
	21	14 00.7	6.0 -12 26	32	-32'		21	14 11.0	7.8 -30 45	8	-7.7	
	29	13 54.7	5.8 -11 54	31	5.9		29	14 03.2	7.6 -30 37	18		
5	7	13 48.9	5.3 -11 23	29	0.401		5	7	13 55.6	7.0 -30 19	25	0.320*
	15	13 43.6	-10 54	1			15	13 48.6	-29 54	2		
202 Chryseis				462 Eriphyla								
	h	m	°		h	m	°					
4	5	14 16.0	5.4 - 0 45	46	66°	4	5	14 23.5	5.6 - 9 31	31	227°	
	13	14 10.6	5.8 + 0 01	42	0.474		13	14 17.9	6.3 - 9 00	34	0.485	
	21	14 04.8	5.9 + 0 43	36	-43'		21	14 11.6	6.4 - 8 26	32	-5.7	
	29	13 58.9	5.6 + 1 19	27	8.8		29	14 05.2	6.3 - 7 54	30		
5	7	13 53.3	4.9 + 1 46	16	0.298*		5	7	13 58.9	5.7 - 7 24	24	0.312
	15	13 48.4	+ 2 02	1			15	13 53.2	- 7 00	2		
918 Itha				483 Seppina								
	h	m	°		h	m	°					
4	5	14 20.0	6.6 -30 04	3	252°	4	5	14 21.1	4.5 + 0 47	63	242°	
	13	14 13.4	7.4 -30 07	8	0.493		13	14 16.6	5.0 + 1 50	59	0.544	
	21	14 06.0	7.6 -29 59	20	-55'		21	14 11.6	5.1 + 2 49	53	-1.3	
	29	13 58.4	7.5 -29 39	29	8.2		29	14 06.5	5.0 + 3 42	46		
5	7	13 50.9	6.9 -29 10	37	0.331		5	7	14 01.5	4.4 + 4 28	35	0.403
	15	13 44.0	-28 33	1			15	13 57.1	+ 5 03	2		
1472 1938 UQ				1285 Julietta								
	h	m	°		h	m	°					
4	5	14 21.8	7.3 -11 57	27	223°	4	5	14 29.7	5.6 -22 58	14	191°	
	13	14 14.5	8.1 -11 30	31	0.414		13	14 24.1	6.3 -22 44	20	0.498	
	21	14 06.4	8.5 -10 59	31	-6.7		21	14 17.8	6.8 -22 24	27	-6.3	
	29	13 57.9	8.2 -10 28	31			29	14 11.0	6.5 -21 57	32		
5	7	13 49.7	7.3 - 9 57	25	0.201		5	7	14 04.5	6.0 -21 25	36	0.333
	15	13 42.4	- 9 32	12			15	13 58.5	-20 49	13		
1327 Namaqua				909 Ulla								
	h	m	°		h	m	°					
4	5	14 20.6	6.1 - 9 29	24	265°	4	5	14 26.8	4.4 + 8 10	50	192°	
	13	14 14.5	6.8 - 9 05	26	0.462		13	14 22.4	4.9 + 9 00	44	0.591	
	21	14 07.7	7.1 - 8 39	25	-60'		21	14 17.5	5.0 + 9 44	36	-3.0	
	29	14 00.6	6.8 - 8 14	21	8.6		29	14 12.5	4.9 +10 20	27		
5	7	13 53.8	6.3 - 7 53	17	0.277		5	7	14 07.6	4.6 +10 47	16	0.470*
	15	13 47.5	- 7 36	1			15	14 03.0	+11 03	2		
454 Mathesis				637 Chrysothemis								
	h	m	°		h	m	°					
4	5	14 22.0	6.5 -13 07	6	6°	4	5	14 29.1	5.2 -15 01	25	44°	
	13	14 15.5	7.3 -13 01	11	0.369		13	14 23.9	6.0 -14 36	29	0.464	
	21	14 08.2	7.7 -12 50	12	-109'		21	14 17.9	6.2 -14 07	31	-52'	
	29	14 00.5	7.3 -12 38	12	14.8		29	14 11.7	6.0 -13 36	31	9.7	
5	7	13 53.2	6.3 -12 26	8	0.126*		5	7	14 05.7	5.5 -13 05	28	0.280
	15	13 46.9	-12 18	1			15	14 00.2	-12 37	1		

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
238 Hypatia				126 Velleda					
	h	m	°		h	m	°		
4	5	14 29.3	5.1 - 6 34 57	182°	4	13	14 36.7	7.1 - 16 14 24	238°
	13	14 24.2	5.7 - 5 37 58	0.502		21	14 29.6	7.8 - 15 50 28	0.414
	21	14 18.5	5.9 - 4 39 55	-2.2		29	14 21.8	7.8 - 15 22 30	-68'
	29	14 12.6	5.9 - 3 44 49		5	7	14 14.0	7.3 - 14 52 30	11.2
5	7	14 06.7	5.7 - 2 55 43	0.338		15	14 06.7	6.3 - 14 22 26	0.201
	15	14 01.0	- 2 12	2*		23	14 00.4	- 13 56	1*
813 Baumeia				8 Flora					
	h	m	°		h	m	°		
4	5	14 34.1	7.0 - 10 35 15	213°	4	5	14 42.9	6.5 - 6 08 42	181°
	13	14 27.1	8.1 - 10 20 19	0.357		13	14 36.4	7.6 - 5 26 43	0.406
	21	14 19.0	8.7 - 10 01 19	-106'		21	14 28.8	8.1 - 4 43 39	-61'
	29	14 10.3	8.4 - 9 42 16	14.8		29	14 20.7	8.1 - 4 04 32	10.8
5	7	14 01.9	7.6 - 9 26 10	0.104	5	7	14 12.6	7.4 - 3 32 24	0.190
	15	13 54.3	- 9 16	1*		15	14 05.2	- 3 08	1*
736 Harvard				692 Hippodamia					
	h	m	°		h	m	°		
4	5	14 36.8	6.2 - 8 01 48	257°	4	5	14 44.2	6.2 + 8 02 14	76°
	13	14 30.6	7.4 - 7 13 50	0.368		13	14 38.0	6.9 + 8 16 1	0.519
	21	14 23.2	8.0 - 6 23 49	-4.9		21	14 31.1	7.3 + 8 17 10	-13.6
	29	14 15.2	8.1 - 5 34 48			29	14 23.8	7.1 + 8 07 21	
5	7	14 07.1	7.4 - 4 46 29	0.102	5	7	14 16.7	6.5 + 7 46 30	0.371
	15	13 59.7	- 4 17	4		15	14 10.2	+ 7 16	2
1474 1935 QY				1450 1938 DP					
	h	m	°		h	m	°		
4	5	14 40.6	8.0 - 50 05 18	180°	4	13	14 40.8	6.9 - 10 35 27	115°
	13	14 32.6	9.0 - 50 23 5	0.610		21	14 33.9	7.3 - 10 08 28	0.456
	21	14 23.6	9.4 - 50 28 11	-4.4		29	14 26.6	7.3 - 9 40 24	-6.3
	29	14 14.2	9.4 - 50 17 25		5	7	14 19.3	6.7 - 9 16 21	
5	7	14 04.8	8.8 - 49 52 39	0.508		15	14 12.6	5.8 - 8 55 14	0.268
	15	13 56.0	- 49 13	5		23	14 06.8	- 8 41	12*
97 Klotho				916 America					
	h	m	°		h	m	°		
4	5	14 36.8	5.6 - 1 50 56	128°	4	13	14 48.7	7.9 - 32 35 2	231°
	13	14 31.2	6.2 - 0 54 53	0.502		21	14 40.8	8.8 - 32 37 12	0.444
	21	14 25.0	6.6 + 0 01 47	-24'		29	14 32.0	9.2 - 32 25 26	-58'
	29	14 18.4	6.3 + 0 46 38	7.0	5	7	14 22.8	8.8 - 31 59 37	10.1
5	7	14 12.1	5.8 + 1 24 29	0.340		15	14 14.0	8.0 - 31 22 45	0.257
	15	14 06.3	+ 1 53	1*		23	14 06.0	- 30 37	1
1224 Fantasia				1154 Astronomia					
	h	m	°		h	m	°		
4	5	14 43.0	6.2 - 24 18 28	199°	4	13	14 43.7	5.4 - 14 17 45	296°
	13	14 36.8	7.4 - 23 50 39	0.439		21	14 38.3	5.7 - 13 32 45	0.524
	21	14 29.4	8.0 - 23 11 49	-3.1		29	14 32.6	5.8 - 12 47 41	-8.4
	29	14 21.4	7.9 - 22 22 56		5	7	14 26.8	5.6 - 12 06 34	
5	7	14 13.5	7.4 - 21 26 59	0.243		15	14 21.2	5.0 - 11 32 28	0.368
	15	14 06.1	- 20 27	5		23	14 16.2	- 11 04	2

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
689 Zita				1547 1929 CZ			
	h	m	°		h	m	°
4	13	14 48.4	6.7	4	13	15 01.1	7.0
	21	14 41.7	7.5		21	14 54.1	7.7
	29	14 34.2	7.8		29	14 46.4	8.0
5	7	14 26.4	7.4	5	7	14 38.4	7.6
	15	14 19.0	6.7		15	14 30.8	6.8
	23	14 12.3			23	14 24.0	
			15 <sup>m</sup> 0				15 <sup>m</sup> 5
			245°				122°
			0.420				0.491
			-40'				-26'
			10 <sup>m</sup> 4				8 <sup>m</sup> 6
			0.212				0.328
			1				1
930 Westphalia				1121 Natascha			
	h	m	°		h	m	°
4	13	14 52.9	8.2	4	13	15 01.1	6.7
	21	14 44.7	9.6		21	14 54.4	7.6
	29	14 35.1	10.3		29	14 46.8	7.8
5	7	14 24.8	10.1	5	7	14 39.0	7.7
	15	14 14.7	8.9		15	14 31.3	7.1
	23	14 05.8			23	14 24.2	
			13 <sup>m</sup> 3				14 <sup>m</sup> 9
			292°				176°
			0.371				0.470
			-110'				-50'
			16 <sup>m</sup> 9				8 <sup>m</sup> 6
			0.147				0.291
			1				1
649 Josefa				1094 Siberia			
	h	m	°		h	m	°
4	13	14 55.6	7.5	4	13	15 03.3	5.9
	21	14 48.1	8.7		21	14 57.4	6.7
	29	14 39.4	9.3		29	14 50.7	6.8
5	7	14 30.1	9.2	5	7	14 43.9	6.5
	15	14 20.9	8.5		15	14 37.4	5.9
	23	14 12.4			23	14 31.5	
			15 <sup>m</sup> 5				14 <sup>m</sup> 0
			270°				112°
			0.438				0.432
			-76'				-3.7
			10 <sup>m</sup> 2				0.241
			0.246				5*
			1				
165 Loreley				1139 Atami			
	h	m	°		h	m	°
4	13	14 54.7	5.9	4	13	15 08.7	7.6
	21	14 48.8	6.7		21	15 01.1	8.5
	29	14 42.1	7.0		29	14 52.6	9.0
5	7	14 35.1	6.8	5	7	14 43.6	8.5
	15	14 28.3	6.1		15	14 35.1	7.6
	23	14 22.2			23	14 27.5	
			10 <sup>m</sup> 9				15 <sup>m</sup> 4
			308°				155°
			0.477				0.382
			-41'				-16'
			10 <sup>m</sup> 4				12 <sup>m</sup> 7
			0.307*				0.148*
			1				1
248 Lameia				277 Elvira			
	h	m	°		h	m	°
4	13	14 55.3	5.9	4	13	15 05.7	5.4
	21	14 49.4	7.0		21	15 00.3	6.3
	29	14 42.4	7.3		29	14 54.0	6.6
5	7	14 35.1	7.0	5	7	14 47.4	6.6
	15	14 28.1	6.1		15	14 40.8	6.0
	23	14 22.0			23	14 34.8	
			12 <sup>m</sup> 7				13 <sup>m</sup> 4
			334°				224°
			0.368				0.489
			-63'				-4.0
			16 <sup>m</sup> 2				0.317
			0.124*				2
			1				
1055 Tynka				651 Antikleia			
	h	m	°		h	m	°
4	13	15 00.2	6.2	4	13	15 06.0	5.8
	21	14 54.0	7.6		21	15 00.2	6.6
	29	14 46.4	8.1		29	14 53.6	7.0
5	7	14 38.3	8.2	5	7	14 46.6	6.8
	15	14 30.1	7.3		15	14 39.8	6.5
	23	14 22.8			23	14 33.3	
			13 <sup>m</sup> 1				14 <sup>m</sup> 0
			283°				202°
			0.341				0.518
			-4.1				-52'
			0.079				6 <sup>m</sup> 6
			3				0.362
							1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
76 Freia				846 Lipperta			
	h	m	°		h	m	°
4	13	15 04.4	5.0 -16 53	4	21	15 02.9	5.7 -17 32
	21	14 59.4	5.6 -16 28		29	14 57.2	6.1 -17 07
	29	14 53.8	5.7 -16 01	5	7	14 51.1	6.1 -16 41
5	7	14 48.1	5.6 -15 32		15	14 45.0	5.7 -16 14
	15	14 42.5	5.3 -15 04		23	14 39.3	5.1 -15 47
	23	14 37.2	-14 37		31	14 34.2	-15 23
			0.444*				0.421
			2*				1
212 Medea				1081 Reseda			
	h	m	°		h	m	°
4	13	15 07.0	5.4 -23 36	4	21	15 03.8	6.0 -18 38
	21	15 01.6	6.0 -23 21		29	14 57.8	6.4 -18 20
	29	14 55.6	6.4 -23 01	5	7	14 51.4	6.3 -18 01
5	7	14 49.2	6.4 -22 36		15	14 45.1	6.0 -17 39
	15	14 42.8	5.9 -22 07		23	14 39.1	5.3 -17 18
	23	14 36.9	-21 36		31	14 33.8	-16 58
			0.386*				0.404
			2*				1
435 Ella				461 Saskia			
	h	m	°		h	m	°
4	13	15 10.8	6.1 -18 38	4	21	15 04.4	5.9 -15 27
	21	15 04.7	7.3 -18 20		29	14 58.5	6.2 -14 59
	29	14 57.4	7.8 -17 56	5	7	14 52.3	6.1 -14 31
5	7	14 49.6	7.9 -17 28		15	14 46.2	5.8 -14 03
	15	14 41.7	7.3 -16 58		23	14 40.4	4.9 -13 38
	23	14 34.4	-16 28		31	14 35.5	-13 16
			0.221				0.366
			1				1
1500 1938 UH				1227 Geranium			
	h	m	°		h	m	°
4	13	15 13.8	7.2 -22 17	4	21	15 10.4	7.4 -35 25
	21	15 06.6	8.3 -22 16		29	15 03.0	8.3 -35 57
	29	14 58.3	9.0 -22 07	5	7	14 54.7	8.6 -36 17
5	7	14 49.3	9.0 -21 51		15	14 46.1	8.3 -36 23
	15	14 40.3	8.3 -21 30		23	14 37.8	7.3 -36 17
	23	14 32.0	-21 06		31	14 30.5	-36 01
			0.218				0.252
			12				1
1368 Numidia				469 Argentina			
	h	m	°		h	m	°
4	13	15 15.3	7.1 -27 47	4	13	15 10.9	5.9 -34 45
	21	15 08.2	8.6 -28 31		21	15 05.0	7.0 -35 04
	29	14 59.6	9.5 -29 06		29	14 58.0	7.6 -35 09
5	7	14 50.1	9.7 -29 29	5	7	14 50.4	7.4 -35 00
	15	14 40.4	9.0 -29 41		15	14 43.0	6.9 -34 38
	23	14 31.4	-29 42		23	14 36.1	-34 07
			0.150				0.241*
			5				1
1544 1941 UK				28 Bellona			
	h	m	°		h	m	°
4	13	15 13.5	6.4 -16 07	4	13	15 10.3	5.5 - 3
	21	15 07.1	7.5 -15 48		21	15 04.8	6.3 - 2
	29	14 59.6	8.0 -15 25		29	14 58.5	6.6 - 2
5	7	14 51.6	7.9 -15 00	5	7	14 51.9	6.5 - 1
	15	14 43.7	7.4 -14 35		15	14 45.4	5.8 - 1
	23	14 36.3	-14 12		23	14 39.6	- 0
			0.206*				0.252*
			12*				1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
184 Dejopeja 12 <sup>m</sup> 0				746 Marlu 11 <sup>m</sup> 9			
4	13	15 <sup>h</sup> 10.9 <sup>m</sup>	5.1	-19 25	17	26°	
	21	15 05.8	5.8	-19 08	21	0.469	
	29	15 00.0	6.4	-18 47	25	-45'	
5	7	14 53.6	6.2	-18 22	27	9 <sup>m</sup> 8	
	15	14 47.4	5.9	-17 55	27	0.287	
	23	14 41.5		-17 28	27	1*	
757 Portlandia 13 <sup>m</sup> 1				1287 Lorcía 14 <sup>m</sup> 0			
4	13	15 <sup>h</sup> 16.9 <sup>m</sup>	6.9	-22 28	5	157°	
	21	15 10.0	8.0	-22 33	3	0.418	
	29	15 02.0	8.7	-22 30	10	-74'	
5	7	14 53.3	8.7	-22 20	15	11 <sup>m</sup> 0	
	15	14 44.6	8.0	-22 05	19	0.207	
	23	14 36.6		-21 46	19	1*	
109 Felicitas 13 <sup>m</sup> 4				388 Charybdis 11 <sup>m</sup> 7			
4	21	15 <sup>h</sup> 10.9 <sup>m</sup>	7.0	-25 17	10	164°	
	29	15 03.9	7.4	-25 07	18	0.541	
5	7	14 56.5	7.4	-24 49	22	-34'	
	15	14 49.1	7.0	-24 27	26	5 <sup>m</sup> 8	
	23	14 42.1	6.3	-24 01	27	0.394	
	31	14 35.8		-23 34	27	1*	
735 Marghanna 12 <sup>m</sup> 9				409 Aspasia 10 <sup>m</sup> 2			
4	21	15 <sup>h</sup> 13.6 <sup>m</sup>	7.5	-17 59	6	271°	
	29	15 06.1	8.3	-18 05	3	0.476	
5	7	14 57.8	8.6	-18 08	1	-70'	
	15	14 49.2	8.4	-18 09	0	7 <sup>m</sup> 2	
	23	14 40.8	7.7	-18 09	0	0.297	
	31	14 33.1		-18 09	0	1	
664 Judith 12 <sup>m</sup> 8				1041 Asta 13 <sup>m</sup> 8			
4	21	15 <sup>h</sup> 08.6 <sup>m</sup>	4.9	- 7 32	55	336°	
	29	15 03.7	5.6	- 6 37	53	0.396	
5	7	14 58.1	5.7	- 5 44	46	-39'	
	15	14 52.4	5.3	- 4 58	37	14 <sup>m</sup> 2	
	23	14 47.1	4.5	- 4 21	25	0.173	
	31	14 42.6		- 3 56	25	1	
372 Palma 11 <sup>m</sup> 6				726 Joella 14 <sup>m</sup> 3			
4	21	15 <sup>h</sup> 17.4 <sup>m</sup>	8.0	-50 04	10	136°	
	29	15 09.4	8.7	-50 14	4	0.580	
5	7	15 00.7	8.8	-50 10	18	-26'	
	15	14 51.9	8.3	-49 52	32	7 <sup>m</sup> 1	
	23	14 43.6	7.4	-49 20	43	0.466	
	31	14 36.2		-48 37	43	1*	
4	21	15 <sup>h</sup> 17.3 <sup>m</sup>	7.5	-37 15	38	310°	
	29	15 09.8	8.6	-37 53	26	0.440	
5	7	15 01.2	9.1	-38 19	10	-88'	
	15	14 52.1	9.0	-38 29	3	11 <sup>m</sup> 9	
	23	14 43.1	8.0	-38 26	16	0.254	
	31	14 35.1		-38 10	16	1	
4	21	15 <sup>h</sup> 13.4 <sup>m</sup>	5.6	-12 57	48	113°	
	29	15 07.8	6.0	-12 09	48	0.491	
5	7	15 01.8	6.0	-11 21	46	-2.0	
	15	14 55.8	5.7	-10 35	42		
	23	14 50.1	4.9	- 9 53	35	0.321	
	31	14 45.2		- 9 18	35	13	
4	21	15 <sup>h</sup> 15.9 <sup>m</sup>	6.3	-25 41	4	277°	
	29	15 09.6	7.0	-25 37	13	0.477	
5	7	15 02.6	7.1	-25 24	18	-50'	
	15	14 55.5	6.8	-25 06	23	9 <sup>m</sup> 3	
	23	14 48.7	6.1	-24 43	26	0.300	
	31	14 42.6		-24 17	26	1*	
4	21	15 <sup>h</sup> 20.4 <sup>m</sup>	6.0	-24 33	56	354°	
	29	15 14.4	6.8	-23 37	66	0.378	
5	7	15 07.6	6.9	-22 31	74	-24'	
	15	15 00.7	6.5	-21 17	75	16 <sup>m</sup> 3	
	23	14 54.2	5.6	-20 02	73	0.141	
	31	14 48.6		-18 49	73	1*	
4	21	15 <sup>h</sup> 21.4 <sup>m</sup>	6.1	-13 06	6	195°	
	29	15 15.3	6.6	-13 00	5	0.542	
5	7	15 08.7	6.7	-12 55	5	-48'	
	15	15 02.0	6.6	-12 50	4	5 <sup>m</sup> 7	
	23	14 55.4	6.0	-12 46	0	0.393	
	31	14 49.4		-12 46	0	1	
4	21	15 <sup>h</sup> 22.6 <sup>m</sup>	6.6	-25 27	50	265°	
	29	15 16.0	7.3	-24 37	59	0.451	
5	7	15 08.7	7.7	-23 38	66	-6'	
	15	15 01.0	7.5	-22 32	72	10 <sup>m</sup> 2	
	23	14 53.5	6.7	-21 20	73	0.261	
	31	14 46.8		-20 07	73	1	



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1119 Euboea				912 Maritima			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 24.2	6.5 -15 13	1	316°		
	29	15 17.7	7.6 -15 14	0	0.372		
5	7	15 10.1	8.0 -15 14	0	-6.3		
	15	15 02.1	7.8 -15 14	2			
	23	14 54.3	6.9 -15 16	5	0.132		
	31	14 47.4	-15 21	5			
133 Cyrene				1525 1939 SC			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 25.1	5.9 -30 09	2	348°		
	29	15 19.2	6.7 -30 07	12	0.425		
5	7	15 12.5	7.1 -29 55	23	-55'		
	15	15 05.4	6.8 -29 32	30	13.5		
	23	14 58.6	6.1 -29 02	37	0.223		
	31	14 52.5	-28 25	1	*		
1093 Freda				1120 Cannonia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 32.8	7.2 -10 53	30	311°		
	29	15 25.6	8.3 -11 23	33	0.440		
5	7	15 17.3	8.8 -11 56	36	-12.5		
	15	15 08.5	8.9 -12 32	39			
	23	14 59.6	8.4 -13 11	42	0.241		
	31	14 51.2	-13 53	3			
1151 Ithaka				318 Magdalena			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 29.2	6.5 -19 04	43	274°		
	29	15 22.7	7.5 -18 21	50	0.407		
5	7	15 15.2	8.0 -17 31	53	-30'		
	15	15 07.2	8.0 -16 38	55	12.3		
	23	14 59.2	7.2 -15 43	51	0.189		
	31	14 52.0	-14 52	1			
1464 1939 VO				284 Amalia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 27.9	5.9 -6 45	14	78°		
	29	15 22.0	6.6 -6 31	10	0.474		
5	7	15 15.4	6.8 -6 21	5	-57'		
	15	15 08.6	6.6 -6 16	1	8.4		
	23	15 02.0	5.9 -6 17	9	0.297		
	31	14 56.1	-6 26	1	*		
919 Ilsebill				974 Lioba			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
4	21	15 27.3	5.3 -19 56	46	304°		
	29	15 22.0	6.2 -19 10	54	0.429		
5	7	15 15.8	6.7 -18 16	57	-19'		
	15	15 09.1	6.6 -17 19	58	12.1		
	23	15 02.5	6.0 -16 21	56	0.226		
	31	14 56.5	-15 25	1			

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1257 Mora				320 Katharina			
	h	m	°		h	m	°
4 21	15	38.7	-18 10	4 29	15	39.9	-17 07
29	15	33.2	5.5 -17 31	5 7	15	34.1	5.8 -16 27
5 7	15	26.6	6.6 -16 47	15	15	27.9	6.2 -15 45
15	15	19.5	7.1 -16 02	23	15	21.6	6.3 -15 03
23	15	12.4	7.1 -15 19	31	15	15.8	5.8 -14 24
31	15	06.2	6.2 -14 40	6 8	15	10.6	5.2 -13 49
			13 <sup>m</sup> 5				14 <sup>m</sup> 1
			4°				238°
			0.356				0.508
			-52'				-11'
			17 <sup>m</sup> 7				7 <sup>m</sup> 8
			0.102				0.344
			1				1
892 Seeligeria				863 Benkoela			
	h	m	°		h	m	°
4 21	15	36.6	4.7 + 3 49	4 29	15	41.3	6.1 +16 53
29	15	31.9	5.2 + 4 52	5 7	15	35.2	6.4 +17 13
5 7	15	26.7	5.6 + 5 47	15	15	28.8	6.4 +17 17
15	15	21.1	5.4 + 6 32	23	15	22.4	5.9 +17 03
23	15	15.7	5.1 + 7 05	31	15	16.5	5.2 +16 32
31	15	10.6	+ 7 26	6 8	15	11.3	+15 44
			13 <sup>m</sup> 5				12 <sup>m</sup> 8
			128°				355°
			0.529				0.482
			-5'				-50'
			6 <sup>m</sup> 9				8 <sup>m</sup> 1
			0.386				0.334
			1				1
193 Ambrosia				192 Nausikaa			
	h	m	°		h	m	°
4 21	15	42.5	7.2 -34 38	4 29	15	47.4	7.8 -29 58
29	15	35.3	8.1 -34 44	5 7	15	39.6	8.8 -29 54
5 7	15	27.2	8.4 -34 41	15	15	30.8	9.0 -29 41
15	15	18.8	8.4 -34 28	23	15	21.8	8.7 -29 17
23	15	10.4	7.8 -34 06	31	15	13.1	7.7 -28 47
31	15	02.6	-33 36	6 8	15	05.4	-28 12
			14 <sup>m</sup> 3				10 <sup>m</sup> 1
			155°				247°
			0.522				0.438
			-32'				-46'
			7 <sup>m</sup> 1				10 <sup>m</sup> 7
			0.373				0.241
			1*				1*
1316 Kasan				1009 Sirene			
	h	m	°		h	m	°
4 29	15	39.4	7.4 -24 01	4 29	15	44.8	6.4 -18 37
5 7	15	32.0	8.0 -22 55	5 7	15	38.4	6.7 -17 57
15	15	24.0	8.0 -21 41	15	15	31.7	6.8 -17 15
23	15	16.0	7.4 -20 23	23	15	24.9	6.5 -16 33
31	15	08.6	6.6 -19 04	31	15	18.4	5.9 -15 52
6 8	15	02.0	-17 48	6 8	15	12.5	-15 14
			16 <sup>m</sup> 7				19 <sup>m</sup> 6
			230°				183°
			0.479				0.583
			+2.2				+1'
			4 <sup>m</sup> 4				4 <sup>m</sup> 4
			0.302				0.450
			5				1
1043 Beate				849 Ara			
	h	m	°		h	m	°
4 29	15	35.8	5.6 - 6 51	4 29	15	44.5	5.4 -19 10
5 7	15	30.2	6.0 - 6 14	5 7	15	39.1	6.0 -17 50
15	15	24.2	6.0 - 5 42	15	15	33.1	6.2 -16 27
23	15	18.2	5.6 - 5 16	23	15	26.9	5.7 -15 02
31	15	12.6	4.8 - 4 58	31	15	21.2	5.0 -13 41
6 8	15	07.8	- 4 48	6 8	15	16.2	-12 26
			13 <sup>m</sup> 4				10 <sup>m</sup> 7
			283°				325°
			0.487				0.432
			-26'				+17'
			8 <sup>m</sup> 5				12 <sup>m</sup> 3
			0.317				0.229
			1				1*
1123 Shapleya				119 Althaea			
	h	m	°		h	m	°
4 29	15	44.2	7.9 -14 25	4 29	15	49.1	6.3 -16 01
5 7	15	36.3	8.6 -14 10	5 7	15	42.8	7.0 -15 21
15	15	27.7	8.7 -13 55	15	15	35.8	7.2 -14 40
23	15	19.0	8.1 -13 41	23	15	28.6	6.8 -14 01
31	15	10.9	7.1 -13 31	31	15	21.8	6.0 -13 25
6 8	15	03.8	-13 26	6 8	15	15.8	-12 54
			14 <sup>m</sup> 5				10 <sup>m</sup> 9
			203°				229°
			0.407				0.436
			-62'				-26'
			11 <sup>m</sup> 2				10 <sup>m</sup> 9
			0.189				0.235
			1				1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1434 Margot				89 Julia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	47.9	5.4 - 3 48 40	4 29	16	01.1	7.9 -44 34 9
5 7	15	42.5	6.1 - 3 08 33	5 7	15	53.2	9.2 -44 43 8
15	15	36.4	6.2 - 2 35 25	15	15	44.0	9.7 -44 35 26
23 17	15	30.2	5.8 - 2 10 15	23 19	15	34.3	9.5 -44 09 44
31	15	24.4	5.2 - 1 55 4	31	15	24.8	8.4 -43 25 60
6 8	15	19.2	- 1 51 4	6 8	15	16.4	-42 25 1
			13 <sup>m</sup> 4				10 <sup>m</sup> 5
			305°				264°
			0.463				0.430
			-3.2				-34'
			0.284*				14 <sup>m</sup> 5
			13				0.242*
							1
807 Ceraskia				904 Rockefelleria			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	48.3	5.7 - 3 22 29	4 29	15	55.3	5.4 - 7 58 54
5 7	15	42.6	6.2 - 2 53 22	5 7	15	49.9	5.9 - 7 04 51
15	15	36.4	6.3 - 2 31 14	15	15	44.0	6.1 - 6 13 45
23 18	15	30.1	5.9 - 2 17 6	23 19	15	37.9	5.8 - 5 28 37
31	15	24.2	5.3 - 2 11 5	31	15	32.1	5.3 - 4 51 28
6 8	15	18.9	- 2 16 1	6 8	15	26.8	- 4 23 1
			13 <sup>m</sup> 6				13 <sup>m</sup> 8
			116°				142°
			0.492				0.505
			-34'				-2'
			7 <sup>m</sup> 9				7 <sup>m</sup> 7
			0.326				0.344
			1				1
228 Agathe				969 Leocadia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	53.4	7.3 -24 57 13	4 29	15	59.3	6.8 -23 28 18
5 7	15	46.1	8.6 -24 44 22	5 7	15	52.5	7.7 -23 10 25
15	15	37.5	9.3 -24 22 32	15	15	44.8	8.2 -22 45 29
23 18	15	28.2	9.1 -23 50 37	23 19	15	36.6	7.9 -22 16 33
31	15	19.1	8.0 -23 13 39	31	15	28.7	7.3 -21 43 32
6 8	15	11.1	-22 34 1	6 8	15	21.4	-21 11 1
			14 <sup>m</sup> 3				15 <sup>m</sup> 2
			294°				244°
			0.325				0.443
			-76'				-33'
			20 <sup>m</sup> 3				10 <sup>m</sup> 4
			0.045*				0.248
			1				1
1494 1938 SI				1127 Mimi			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	53.4	7.3 -17 49 33	4 29	16	03.5	6.1 - 0 11 32
5 7	15	46.1	8.3 -17 16 37	5 7	15	57.4	6.7 + 0 21 25
15	15	37.8	8.6 -16 39 37	15	15	50.7	7.0 + 0 46 16
23 18	15	29.2	8.1 -16 02 35	23 20	15	43.7	6.8 + 1 02 7
31	15	21.1	7.1 -15 27 30	31	15	36.9	6.3 + 1 09 4
6 8	15	14.0	-14 57 12	6 8	15	30.6	+ 1 05 13
			16 <sup>m</sup> 2				14 <sup>m</sup> 4
			228°				189°
			0.380				0.517
			-3.0				-4.5
			0.144				0.366
			12				13
375 Ursula				31 Euphrosyne			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	54.6	7.1 -43 17 20	4 29	16	07.4	7.4 -38 37 33
5 7	15	47.5	8.1 -43 37 4	5 7	16	00.0	8.4 -39 10 24
15	15	39.4	8.5 -43 41 10	5 15	15	51.6	8.6 -39 34 13
23 18	15	30.9	8.1 -43 31 24	23 20	15	43.0	8.6 -39 47 3
31	15	22.8	7.3 -43 07 36	31	15	34.4	8.0 -39 50 5
6 8	15	15.5	-42 31 1	6 8	15	26.4	-39 45 1
			10 <sup>m</sup> 8				11 <sup>m</sup> 8
			300°				137°
			0.476				0.568
			-44'				-47'
			11 <sup>m</sup> 8				5 <sup>m</sup> 7
			0.312*				0.438*
			1				1
569 Misa				488 Kreusa			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
4 29	15	54.3	6.7 -22 07 20	4 29	16	03.7	6.0 -11 33 2
5 7	15	47.6	7.2 -21 47 23	5 7	15	57.7	6.7 -11 31 0
15	15	40.4	7.4 -21 24 26	15	15	51.0	6.9 -11 31 4
23 18	15	33.0	7.1 -20 58 27	23 21	15	44.1	6.7 -11 35 8
31	15	25.9	6.3 -20 31 26	31	15	37.4	6.0 -11 43 12
6 8	15	19.6	-20 05 1	6 8	15	31.4	-11 55 1
			13 <sup>m</sup> 2				11 <sup>m</sup> 1
			145°				60°
			0.487				0.470
			-28'				-57'
			8 <sup>m</sup> 3				8 <sup>m</sup> 9
			0.315				0.291*
			1				1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
891 Gunhild				1447 1938 BB			
	h	m	°		h	m	°
4 29	16	04.8	5.9	4 29	16	10.7	6.6
5 7	15	58.9	6.6	5 7	16	04.1	7.7
15	15	52.3	6.9	15 22	15	56.4	8.1
23 21	15	45.4	6.8	23 22	15	48.3	8.2
31	15	38.6	6.2	31	15	40.1	7.1
6 8	15	32.4	—	6 8	15	33.0	—
			13 <sup>m</sup> 5				15 <sup>m</sup> 4
			195°				318°
			0.468				0.416
			-50'				-4.1
			8 <sup>m</sup> 6				0.204
			0.291				12
			1				
197 Arete				245 Vera			
	h	m	°		h	m	°
4 29	16	05.6	6.1	4 29	16	08.4	5.6
5 7	15	59.5	7.1	5 7	16	02.8	6.2
15	15	52.4	7.6	15 22	15	56.6	6.5
23 21	15	44.8	7.5	23 22	15	50.1	6.6
31	15	37.3	7.0	31	15	43.5	6.1
6 8	15	30.3	—	6 8	15	37.4	—
			12 <sup>m</sup> 5				13 <sup>m</sup> 3
			290°				227°
			0.426				0.553
			-62'				-27'
			11 <sup>m</sup> 2				6 <sup>m</sup> 1
			0.220*				0.410*
			1				1
1350 Rosselia				1298 Nocturna			
	h	m	°		h	m	°
4 29	16	05.2	5.5	4 29	16	09.5	5.6
5 7	15	59.7	6.6	5 7	16	03.9	6.3
15	15	53.1	6.9	15 22	15	57.6	6.8
23 21	15	46.2	6.7	23 22	15	50.8	6.8
31	15	39.5	6.1	31	15	44.0	6.4
6 8	15	33.4	—	6 8	15	37.6	—
			15 <sup>m</sup> 3				14 <sup>m</sup> 1
			229°				261°
			0.483				0.515
			-3.5				-21'
			0.308*				8 <sup>m</sup> 3
			13*				0.357
							1
341 California				1515 1936 VG			
	h	m	°		h	m	°
4 29	16	12.2	6.5	4 29	16	13.1	6.7
5 7	16	05.7	8.4	5 7	16	06.4	7.7
15	15	57.3	9.5	15 22	15	58.7	8.1
23 21	15	47.8	9.6	23 22	15	50.6	8.2
31	15	38.2	9.0	31	15	42.4	7.7
6 8	15	29.2	—	6 8	15	34.7	—
			12 <sup>m</sup> 7				16 <sup>m</sup> 1
			300°				210°
			0.316				0.492
			-104'				-46'
			22 <sup>m</sup> 0				7 <sup>m</sup> 6
			0.028				0.323*
			1				1
279 Thule				179 Klytaemnestra			
	h	m	°		h	m	°
4 29	16	04.7	4.4	5 7	16	10.4	6.3
5 7	16	00.3	4.8	15	16	04.1	6.7
15	15	55.5	5.1	23 22	15	57.4	6.8
23 21	15	50.4	5.0	31 23	15	50.6	6.3
31	15	45.4	4.8	6 8	15	44.3	5.5
6 8	15	40.6	—	16	15	38.8	—
			13 <sup>m</sup> 6				11 <sup>m</sup> 7
			316°				259°
			0.621				0.487
			-3.6				-11'
			0.500				9 <sup>m</sup> 1
			2				0.314*
							1
136 Austria				1520 1938 UY			
	h	m	°		h	m	°
4 29	16	09.1	5.8	5 7	16	10.4	6.1
5 7	16	03.3	6.9	15	16	04.3	6.6
15	15	56.4	7.5	23 22	15	57.7	6.6
23 21	15	48.9	7.3	31 23	15	51.1	6.2
31	15	41.6	6.7	6 8	15	44.9	5.4
6 8	15	34.9	—	16	15	39.5	—
			11 <sup>m</sup> 1				15 <sup>m</sup> 8
			290°				243°
			0.351				0.515
			-27'				+0.8
			16 <sup>m</sup> 9				0.355
			0.096*				12
			1				

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
257 Silesia				1532 1938 SM			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 11.1 6.2	-23 13 9	183°	5 7	16 15.5 6.9	-34 10 4	144°
15	16 04.9 6.6	-23 04 12	0.540	15	16 08.6 7.5	-34 06 12	0.494
23	15 58.3 6.5	-22 52 14	-3.7	23	16 01.1 7.4	-33 54 21	-2.6
31	15 51.8 6.2	-22 38 14		31	15 53.7 7.1	-33 33 29	
6 8	15 45.6 5.6	-22 24 15	0.391	6 8	15 46.6 6.2	-33 04 33	0.327
16	15 40.0	-22 09	14	16	15 40.4	-32 31	12
282 Clorinde				1414 Jerome			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 13.4 7.2	- 6 12 32	156°	5 7	16 17.1 6.4	- 7 28 26	80°
15	16 06.2 7.7	- 5 40 26	0.401	15	16 10.7 6.9	- 7 02 20	0.444
23	15 58.5 7.7	- 5 14 15	-40'	23	16 03.8 6.9	- 6 42 12	-3.4
31	15 50.8 7.1	- 4 59 4	12 <sup>m</sup> 1	31	15 56.9 6.3	- 6 30 3	
6 8	15 43.7 6.0	- 4 55 8	0.183*	6 8	15 50.6 5.5	- 6 27 6	0.251
16	15 37.7	- 5 03	1	16	15 45.1	- 6 33	3
259 Aletheia				1455 Mitchella			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 11.8 6.2	-12 14 3	354°	5 7	16 18.4 6.6	- 6 23 22	10°
15	16 05.6 6.8	-12 17 8	0.436	15	16 11.8 7.5	- 6 01 10	0.294
23	15 58.8 6.8	-12 25 11	-65'	23	16 04.3 7.6	- 5 51 4	-3.8
31	15 52.0 6.4	-12 36 16	11 <sup>m</sup> 1	31	15 56.7 6.9	- 5 55 18	
6 8	15 45.6 5.5	-12 52 21	0.236*	6 8	15 49.8 5.6	- 6 13 31	9.989*
16	15 40.1	-13 13	1	16	15 44.2	- 6 44	5
938 Chlosinde				267 Tirza			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 11.4 5.9	-17 40 16	284°	5 7	16 19.2 6.6	-18 39 1	339°
15	16 05.5 6.5	-17 24 17	0.495	15	16 12.6 7.2	-18 40 0	0.401
23	15 59.0 6.6	-17 07 17	-28'	23	16 05.4 7.5	-18 40 1	-64'
31	15 52.4 6.2	-16 50 14	8 <sup>m</sup> 3	31	15 57.9 7.0	-18 41 2	13 <sup>m</sup> 7
6 8	15 46.2 5.6	-16 36 11	0.326	6 8	15 50.9 6.1	-18 43 4	0.178*
16	15 40.6	-16 25	1	16	15 44.8	-18 47	1
725 Amanda				103 Hera			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 14.4 7.1	-20 14 12	225°	5 7	16 18.7 6.3	-12 56 22	289°
15	16 07.3 7.7	-20 02 13	0.479	15	16 12.4 6.9	-12 34 20	0.424
23	15 59.6 7.8	-19 49 15	-34'	23	16 05.5 7.1	-12 14 16	-38'
31	15 51.8 7.4	-19 34 15	8 <sup>m</sup> 2	31	15 58.4 6.8	-11 58 9	11 <sup>m</sup> 7
6 8	15 44.4 6.6	-19 19 12	0.302	6 8	15 51.6 5.9	-11 49 4	0.216*
16	15 37.8	-19 07	1	16	15 45.7	-11 45	1
207 Hedda				1346 Gotha			
	<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>			<sup>h</sup> <sup>m</sup> <sup>s</sup> <sup>°</sup> <sup>'</sup>	<sup>°</sup> <sup>'</sup>	
5 7	16 17.5 7.8	-24 35 0	21°	5 7	16 20.0 6.2	- 1 55 41	191°
15	16 09.7 8.7	-24 35 5	0.347	15	16 13.8 6.7	- 1 14 34	0.490
23	16 01.0 8.7	-24 30 11	-74'	23	16 07.1 6.8	- 0 40 23	-14'
31	15 52.3 8.1	-24 19 14	18 <sup>m</sup> 4	31	16 00.3 6.4	- 0 17 13	7 <sup>m</sup> 5
6 8	15 44.2 6.8	-24 05 15	0.083*	6 8	15 53.9 5.8	- 0 04 2	0.326*
16	15 37.4	-23 50	1	16	15 48.1	- 0 02	1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
185 Eunike				604 Tekmessa			
	h	m	°		h	m	°
5	7	16 20.2	5.9 +12 35	5	7	16 29.2	5.9 -26 28
	15	16 14.3	6.5 +13 22		15	16 23.3	6.5 -26 23
	23	16 07.8	6.6 +13 53		23	16 16.8	6.6 -26 16
	31	16 01.2	6.3 +14 07		31	16 10.2	6.6 -26 04
6	8	15 54.9	5.6 +14 04	6	8	16 03.6	6.0 -25 49
	16	15 49.3	+13 44		16	15 57.6	-25 33
			10 <sup>m</sup> 6				13 <sup>m</sup> 1
			234°				217°
			0.473				0.563
			-2.1				-21
							6 <sup>m</sup> 2
			0.319				0.423
			2*				1
990 Yerkes				57 Mnemosyne			
	h	m	°		h	m	°
5	7	16 25.2	7.4 -33 56	5	7	16 31.8	5.1 - 7 43
	15	16 17.8	8.4 -34 07		15	16 26.7	5.7 - 6 59
	23	16 09.4	8.8 -34 07		23	16 21.0	5.9 - 6 19
	31	16 00.6	8.5 -33 56		31	16 15.1	5.7 - 5 45
6	8	15 52.1	7.7 -33 37	6	8	16 09.4	5.4 - 5 18
	16	15 44.4	-33 10		16	16 04.0	- 4 58
			15 <sup>m</sup> 9				11 <sup>m</sup> 2
			268°				198°
			0.449				0.540
			-42				+2
			11 <sup>m</sup> 3				6 <sup>m</sup> 5
			0.260				0.394
			1				1*
965 Angelica				565 Marbachia			
	h	m	°		h	m	°
5	7	16 24.0	6.9 -32 11	5	7	16 35.4	6.6 -17 44
	15	16 17.1	7.5 -32 29		15	16 28.8	7.5 -16 43
	23	16 09.6	7.6 -32 41		23	16 21.3	7.7 -15 42
	31	16 02.0	7.3 -32 46		31	16 13.6	7.2 -14 44
6	8	15 54.7	6.8 -32 46	6	8	16 06.4	6.2 -13 51
	16	15 47.9	-32 42		16	16 00.2	-13 07
			16 <sup>m</sup> 0				12 <sup>m</sup> 8
			148°				76°
			0.594				0.380
			-36				-3
			4 <sup>m</sup> 7				15 <sup>m</sup> 1
			0.467				0.144
			1				1*
1214 Richilde				329 Svea			
	h	m	°		h	m	°
5	7	16 28.0	6.6 -33 01	5	7	16 34.0	5.7 + 0 52
	15	16 21.4	7.6 -32 41		15	16 28.3	6.7 + 2 01
	23	16 13.8	8.0 -32 11		23	16 21.6	6.9 + 2 59
	31	16 05.8	7.5 -31 30		31	16 14.7	6.7 + 3 40
6	8	15 58.3	6.7 -30 41	6	8	16 08.0	5.9 + 4 04
	16	15 51.6	-29 46		16	16 02.1	+ 4 08
			12 <sup>m</sup> 7				12 <sup>m</sup> 0
			301°				18°
			0.412				0.383
			-0.9				-13
							14 <sup>m</sup> 1
			0.199				0.163
			5				1*
343 Ostara				1438 Wendeline			
	h	m	°		h	m	°
5	7	16 31.2	7.3 -23 45	5	7	16 35.4	5.6 -22 03
	15	16 23.9	8.1 -23 38		15	16 29.8	6.3 -21 48
	23	16 15.8	8.4 -23 28		23	16 23.5	6.6 -21 31
	31	16 07.4	8.1 -23 14		31	16 16.9	6.6 -21 11
6	8	15 59.3	7.5 -22 57	6	8	16 10.3	6.1 -20 51
	16	15 51.8	-22 40		16	16 04.2	-20 31
			14 <sup>m</sup> 6				15 <sup>m</sup> 5
			209°				269°
			0.466				0.523
			-32				-15
			8 <sup>m</sup> 9				7 <sup>m</sup> 5
			0.282				0.367
			1				1*
205 Martha				1013 Tombecka			
	h	m	°		h	m	°
5	7	16 28.3	5.8 -14 22	5	7	16 43.6	7.6 -32 48
	15	16 22.5	6.6 -13 35		15	16 36.0	8.6 -33 11
	23	16 15.9	6.7 -12 50		23	16 27.4	8.9 -33 25
	31	16 09.2	6.5 -12 07		31	16 18.5	8.7 -33 30
6	8	16 02.7	5.8 -11 31	6	8	16 09.8	7.8 -33 26
	16	15 56.9	-11 01		16	16 02.0	-33 15
			12 <sup>m</sup> 8				13 <sup>m</sup> 7
			223°				101°
			0.455				0.463
			-3				-4.1
			10 <sup>m</sup> 2				
			0.267				0.280
			1				3



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
629 Bernardina				381 Myrrha			
	h m	° '	14 <sup>m</sup> 2		h m	° '	11 <sup>m</sup> 6
5 7	16 40.0	5.8 -16 44	1 112°	5 7	16 45.5	4.9 -5 10	16 346°
15	16 34.2	6.4 -16 43	2 0.526	15	16 40.6	5.8 -4 54	8 0.447
23	16 27.8	6.7 -16 41	0 -33'	23	16 34.8	6.3 -4 46	0 -43'
31	16 21.1	6.6 -16 41	2 6 <sup>m</sup> 9	31	16 28.5	6.3 -4 46	9 10 <sup>m</sup> 4
6 8	16 14.5	6.0 -16 43	3 0.371	6 8	16 22.2	5.8 -4 55	19 0.259*
16	16 08.5	-16 46	1	16	16 16.4	-5 14	1
1109 Tata				1518 1938 UA			
	h m	° '	12 <sup>m</sup> 9		h m	° '	16 <sup>m</sup> 6
5 7	16 43.4	5.1 -25 07	16 351°	5 15	16 52.0	8.7 -29 23	11 189°
15	16 38.3	6.1 -24 51	22 0.442	23	16 43.3	9.5 -29 34	3 0.405
23	16 32.2	6.6 -24 29	24 -18'	31	16 33.8	9.6 -29 37	5 -3.2
31	16 25.6	6.5 -24 05	28 12 <sup>m</sup> 5	6 8	16 24.2	9.0 -29 32	12
6 8	16 19.1	5.9 -23 37	28 0.246	16	16 15.2	7.9 -29 20	16 0.185
16	16 13.2	-23 09	1	24	16 07.3	-29 04	12
1105 Fragaria				814 Tauris			
	h m	° '	13 <sup>m</sup> 7		h m	° '	13 <sup>m</sup> 4
5 7	16 44.7	5.3 -9 08	13 278°	5 15	16 47.6	6.2 -10 16	6 250°
15	16 39.4	6.2 -8 55	8 0.477	23	16 41.4	6.6 -10 22	9 0.569
23	16 33.2	6.6 -8 47	3 -4.1	31	16 34.8	6.8 -10 31	14 -38'
31	16 26.6	6.7 -8 44	4 4 <sup>m</sup> 6	6 8	16 28.0	6.5 -10 45	17
6 8	16 19.9	6.2 -8 48	11 0.303	16	16 21.5	6.1 -11 02	23 0.433
16	16 13.7	-8 59	5	24	16 15.4	-11 25	1
224 Oceana				1516 1938 BG			
	h m	° '	11 <sup>m</sup> 5		h m	° '	13 <sup>m</sup> 0
5 7	16 47.4	6.3 -31 06	11 339°	5 15	16 49.3	6.3 -8 08	6 22°
15	16 41.1	7.5 -31 17	2 0.405	23	16 43.0	7.1 -8 02	5 0.337
23	16 33.6	8.2 -31 19	6 -41'	31	16 35.9	7.0 -8 07	16 -70'
31	16 25.4	8.2 -31 13	15 15 <sup>m</sup> 1	6 8	16 28.9	6.4 -8 23	26 19 <sup>m</sup> 0
6 8	16 17.2	7.5 -30 58	21 0.189*	16	16 22.5	5.3 -8 49	36 0.070*
16	16 09.7	-30 37	1	24	16 17.2	-9 25	1
301 Bavaria				899 Jokaste			
	h m	° '	12 <sup>m</sup> 3		h m	° '	14 <sup>m</sup> 1
5 15	16 42.8	6.4 -14 31	18 346°	5 15	16 50.8	6.4 -24 20	33 253°
23	16 36.4	7.1 -14 13	14 0.408	23	16 44.4	7.0 -23 47	37 0.502
31	16 29.3	7.0 -13 59	9 -37'	31	16 37.4	7.2 -23 10	39 +6'
6 8	16 22.3	6.5 -13 50	4 13 <sup>m</sup> 1	6 8	16 30.2	6.8 -22 31	41 8 <sup>m</sup> 2
16	16 15.8	5.5 -13 46	1 0.190	16	16 23.4	6.1 -21 50	40 0.336
24	16 10.3	-13 47	1	24	16 17.3	-21 10	1
1225 Ariane				1072 Malva			
	h m	° '	14 <sup>m</sup> 2		h m	° '	15 <sup>m</sup> 0
5 15	16 48.2	8.4 -26 40	3 132°	5 15	16 52.8	6.2 -28 17	3 193°
23	16 39.8	9.1 -26 37	9 0.371	23	16 46.6	6.6 -28 20	0 0.588
31	16 30.7	9.1 -26 28	15 -47'	31	16 40.0	6.7 -28 20	4 -20'
6 8	16 21.6	8.3 -26 13	18 16 <sup>m</sup> 1	6 8	16 33.3	6.5 -28 16	7 5 <sup>m</sup> 4
16	16 13.3	6.9 -25 55	20 0.127*	16	16 26.8	6.0 -28 09	10 0.457
24	16 06.4	-25 35	1	24	16 20.8	-27 59	1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
378 Holmia				521 Brixia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	16	53.8	-20 03	5 15	17	02.6	-17 27
23	16	47.5	-19 35	23	16	56.2	-17 28
31	16	40.6	-19 05	31	16	49.1	-17 29
6 8	16	33.5	-18 36	6 8	16	41.7	-17 32
16	16	26.6	-18 07	16	16	34.4	-17 35
24	16	20.6	-17 42	24	16	27.6	-17 41
			13 <sup>m</sup> 0				13 <sup>m</sup> 2
			233°				227°
			0.479				0.527
			-0.3				-29'
			0.302				6 <sup>m</sup> 3
			2				0.372
							1
433 Eros				963 Iduberga			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	17	17.8	-46 59	5 15	17	07.5	-24 16
23	17	01.4	-46 25	23	16	59.6	-24 32
31	16	43.4	-45 10	31	16	50.7	-24 44
6 8	16	26.5	-43 19	6 8	16	41.3	-24 53
16	16	12.5	-41 02	16	16	32.2	-24 58
24	16	02.6	-38 35	24	16	24.0	-25 01
			11 <sup>m</sup> 6				15 <sup>m</sup> 1
			108°				194°
			0.207				0.406
			-51'				-51'
			49 <sup>m</sup> 6				12 <sup>m</sup> 6
			9.798				0.187
			1*				1*
810 Atossa				932 Hooveria			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	16	56.9	-18 01	5 15	17	08.3	-33 15
23	16	49.6	-17 41	23	17	00.6	-33 34
31	16	41.2	-17 22	31	16	51.7	-33 43
6 8	16	32.2	-17 04	6 8	16	42.4	-33 43
16	16	23.6	-16 50	16	16	33.4	-33 34
24	16	16.0	-16 40	24	16	25.3	-33 17
			14 <sup>m</sup> 3				12 <sup>m</sup> 0
			283°				193°
			0.338				0.421
			-42'				-38'
			18 <sup>m</sup> 3				13 <sup>m</sup> 2
			0.068				0.215
			1				1
1115 Sabauda				560 Delila			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	16	55.2	-20 49	5 15	17	09.3	-15 42
23	16	48.6	-21 04	23	17	03.0	-15 41
31	16	41.5	-21 19	31	16	55.9	-15 41
6 8	16	34.3	-21 33	6 8	16	48.6	-15 44
16	16	27.4	-21 46	16	16	41.6	-15 49
24	16	21.2	-21 59	24	16	35.0	-15 57
			13 <sup>m</sup> 9				14 <sup>m</sup> 0
			113°				134°
			0.526				0.489
			-43'				-3.6
			6 <sup>m</sup> 8				0.317
			0.371				2
			1				
718 Erida				298 Baptistina			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	16	55.9	-27 58	5 15	17	13.6	-32 19
23	16	49.4	-28 16	23	17	05.6	-32 37
31	16	42.0	-28 28	31	16	56.4	-32 44
6 8	16	34.5	-28 35	6 8	16	46.7	-32 41
16	16	27.5	-28 36	16	16	37.4	-32 28
24	16	21.5	-28 33	24	16	29.2	-32 07
			11 <sup>m</sup> 7				13 <sup>m</sup> 7
			27°				103°
			0.403				0.367
			-54'				-42'
			15 <sup>m</sup> 3				17 <sup>m</sup> 8
			0.182				0.123
			1*				1*
822 Lalage				384 Burdigala			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5 15	16	59.6	-22 04	5 15	17	11.0	-26 03
23	16	51.7	-21 49	23	17	04.2	-26 10
31	16	43.1	-21 32	31	16	56.6	-26 13
6 8	16	34.4	-21 13	6 8	16	48.7	-26 12
16	16	26.1	-20 55	16	16	40.9	-26 08
24	16	18.9	-20 37	24	16	33.8	-26 01
			14 <sup>m</sup> 2				12 <sup>m</sup> 5
			148°				172°
			0.409				0.483
			-26'				-27'
			12 <sup>m</sup> 5				8 <sup>m</sup> 9
			0.190				0.308
			1*				1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
848 Inna				1107 Lictoria			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	13 <sup>m</sup> 7		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	13 <sup>m</sup> 1
5 15	17 10.2	5.5 -22 00	10 301°	5 15	17 18.2	5.4 -16 59	2 137°
23	17 04.7	6.4 -21 50	12 0.465	23	17 12.8	6.0 -16 57	2 0.540
31	16 58.3	6.8 -21 38	13 -17'	31	17 06.8	6.4 -16 55	0 -21'
6 8	16 51.5	6.8 -21 25	14 10 <sup>m</sup> 6	6 8	17 00.4	6.3 -16 55	1 6 <sup>m</sup> 7
16	16 44.7	6.3 -21 11	12 0.281	16	16 54.1	6.0 -16 56	5 0.390
24	16 38.4	-20 59	1	24	16 48.1	-17 01	1
307 Nike				887 Alinda			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	13 <sup>m</sup> 8		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	18 <sup>m</sup> 9
5 15	17 13.6	5.8 -18 44	2 196°	5 23	17 19.2	7.6 -15 40	4 119°
23	17 07.8	6.5 -18 42	2 0.520	31	17 11.6	8.0 -15 36	2 0.550
31	17 01.3	6.9 -18 40	1 -3.1	6 8	17 03.6	7.8 -15 34	0 -18'
6 8	16 54.4	6.9 -18 39	1 4 <sup>m</sup> 7	16	16 55.8	7.2 -15 34	2
16	16 47.5	6.3 -18 38	2 0.362	24	16 48.6	6.6 -15 36	4 0.404*
24	16 41.2	-18 40	2	7 2	16 42.0	-15 40	1
1435 Garlena				373 Melusina			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	17 <sup>m</sup> 0		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	12 <sup>m</sup> 7
5 15	17 17.2	6.2 -18 05	16 147°	5 23	17 21.1	7.8 -44 17	25 286°
23	17 11.0	7.0 -17 49	16 0.510	31	17 13.3	8.6 -44 42	13 0.485
31	17 04.0	7.4 -17 33	15 -1.0	6 8	17 04.7	8.9 -44 55	0 -30'
6 8	16 56.6	7.2 -17 18	13 11 <sup>m</sup> 8	16	16 55.8	8.4 -44 55	14
16	16 49.4	6.6 -17 05	10 0.347*	24	16 47.4	7.4 -44 41	24 0.320
24	16 42.8	-16 55	5	7 2	16 40.0	-44 17	1
1409 Isko				1226 Golia			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	13 <sup>m</sup> 6		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	14 <sup>m</sup> 3
5 23	17 15.9	6.5 -13 04	21 238°	5 23	17 24.5	8.3 -36 16	23 88°
31	17 09.4	7.1 -12 43	18 0.442	31	17 16.2	9.1 -36 39	11 0.415
6 8	17 02.3	7.1 -12 25	12 -13'	6 8	17 07.1	9.1 -36 50	0 -2.2
16	16 55.2	6.7 -12 13	6 10 <sup>m</sup> 7	16	16 58.0	8.5 -36 50	9
24	16 48.5	5.7 -12 07	0 0.245	24	16 49.5	7.1 -36 41	19 0.205
7 2	16 42.8	-12 07	1	7 2	16 42.4	-36 22	5
1137 Raissa				1459 Magnya			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	13 <sup>m</sup> 0		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	14 <sup>m</sup> 3
5 23	17 18.3	7.5 -22 20	7 273°	5 23	17 22.7	7.3 -36 25	34 277°
31	17 10.8	8.3 -22 27	4 0.385	31	17 15.4	8.2 -36 59	26 0.510
6 8	17 02.5	8.4 -22 31	4 -2.6	6 8	17 07.2	8.4 -37 25	17 -42'
16	16 54.1	8.0 -22 35	3 8 <sup>m</sup> 8	16	16 58.8	8.2 -37 42	8
24	16 46.1	6.8 -22 38	3 0.152	24	16 50.6	7.4 -37 50	1 0.350
7 2	16 39.3	-22 41	5	7 2	16 43.2	-37 51	1
62 Erato				403 Cyane			
	<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	12 <sup>m</sup> 9		<sup>h</sup> <sup>m</sup>	<sup>°</sup> <sup>'</sup>	12 <sup>m</sup> 3
5 15	17 16.8	5.4 -20 39	7 233°	5 23	17 21.7	6.7 -21 11	31 112°
23	17 11.4	6.1 -20 32	7 0.546	31	17 15.0	7.2 -20 40	32 0.467
31	17 05.3	6.5 -20 25	8 -1.7	6 8	17 07.8	7.1 -20 08	30 +6'
6 8	16 58.8	6.5 -20 17	7 9 <sup>m</sup> 9	16	17 00.7	6.7 -19 38	29
16	16 52.3	6.2 -20 10	7 0.399*	24	16 54.0	5.7 -19 09	26 0.283
24	16 46.1	-20 03	2	7 2	16 48.3	-18 43	1

# OPPOSITION EPHEMERIDES

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
500 Selinur				871 Amneris					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 24.9	7.5 -32 23 18	271°	5	23	17 32.1	6.7 -14 59 15	29°
	31	17 17.4	8.2 -32 05 27	0.425		31	17 25.4	7.8 -14 44 9	0.301
6	8	17 09.2	8.5 -31 38 35	+3'	6	8	17 17.6	8.0 -14 35 1	-41'
	16	17 00.7	8.0 -31 03 41	13 <sup>m</sup> 3		16	17 09.6	7.4 -14 34 5	24 <sup>m</sup> 0
	24	16 52.7	7.0 -30 22 46	0.218*		24	17 02.2	6.1 -14 39 13	9.995*
7	2	16 45.7	-29 36	1	7	2	16 56.1	-14 52	1
654 Zelinda				1263 Varsavia					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 29.4	9.8 -35 44 48	103°	5	23	17 31.7	6.2 +17 30 30	167°
	31	17 19.6	10.3 -34 56 59	0.401		31	17 25.5	6.7 +18 00 12	0.500
6	8	17 09.3	10.0 -33 57 70	+33'	6	8	17 18.8	6.8 +18 12 6	-2.5
	16	16 59.3	9.0 -32 47 76	14 <sup>m</sup> 3		16	17 12.0	6.6 +18 06 23	
	24	16 50.3	7.4 -31 31 78	0.180*		24	17 05.4	6.0 +17 43 41	0.367
7	2	16 42.9	-30 13	1	7	2	16 59.4	+17 02	13
905 Universitas				1184 Gaea					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 29.1	8.2 -28 40 17	256°	5	23	17 35.6	7.6 -41 08 26	321°
	31	17 20.9	9.3 -28 57 12	0.371		31	17 28.0	8.9 -41 34 13	0.402
6	8	17 11.6	9.8 -29 09 4	-43'	6	8	17 19.1	9.3 -41 47 2	-1.2
	16	17 01.8	9.4 -29 13 2	16 <sup>m</sup> 5		16	17 09.8	8.9 -41 45 17	
	24	16 52.4	8.2 -29 11 7	0.126*		24	17 00.9	7.7 -41 28 29	0.188
7	2	16 44.2	-29 04	1	7	2	16 53.2	-40 59	5
274 Philagoria				1126 Otero					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 25.5	6.2 -21 21 3	37°	5	23	17 39.8	8.5 -33 42 15	110°
	31	17 19.3	6.9 -21 24 3	0.440		31	17 31.3	9.6 -33 57 4	0.385
6	8	17 12.4	7.0 -21 27 2	-23'	6	8	17 21.7	9.9 -34 01 6	-24'
	16	17 05.4	6.5 -21 29 2	12 <sup>m</sup> 1		16	17 11.8	9.3 -33 55 16	16 <sup>m</sup> 2
	24	16 58.9	5.7 -21 31 4	0.240		24	17 02.5	8.0 -33 39 24	0.153*
7	2	16 53.2	-21 35	7	7	2	16 54.5	-33 15	1
732 Tjilaki				696 Leonora					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 29.4	6.3 - 5 00 35	24°	5	23	17 36.4	6.4 -35 12 6	235°
	31	17 23.1	7.1 - 4 25 22	0.374		31	17 30.0	7.0 -35 06 13	0.569
6	8	17 16.0	7.3 - 4 03 10	-15'	6	8	17 23.0	7.3 -34 53 19	+7'
	16	17 08.7	6.9 - 3 53 4	15 <sup>m</sup> 0		16	17 15.7	7.1 -34 34 25	6 <sup>m</sup> 6
	24	17 01.8	6.0 - 3 57 17	0.142		24	17 08.6	6.5 -34 09 30	0.434
7	2	16 55.8	- 4 14	1	7	2	17 02.1	-33 39	1
494 Virtus				608 Adolfine					
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		
5	23	17 30.6	6.6 -29 48 19	8°	5	23	17 39.9	6.3 -31 33 10	273°
	31	17 24.0	7.4 -30 07 12	0.446		31	17 33.6	7.1 -31 23 16	0.485
6	8	17 16.6	7.6 -30 19 7	-31'	6	8	17 26.5	7.5 -31 07 23	+6'
	16	17 09.0	7.3 -30 26 2	12 <sup>m</sup> 3		16	17 19.0	7.4 -30 44 28	10 <sup>m</sup> 1
	24	17 01.7	6.5 -30 28 3	0.252*		24	17 11.6	6.6 -30 16 32	0.312*
7	2	16 55.2	-30 25	1	7	2	17 05.0	-29 44	1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
625 Xenia 11 <sup>m</sup> 3				1169 Alwine 15 <sup>m</sup> 8			
5	23	17 40.1	5.7	5	23	17 49.0	7.1
	31	17 34.4	6.8		31	17 41.9	8.1
6	8	17 27.6	7.4	6	8	17 33.8	8.6
	16	17 20.2	7.5		16	17 25.2	8.4
	24	17 12.7	6.8		24	17 16.8	7.8
7	2	17 05.9		7	2	17 09.0	
61 Danae 10 <sup>m</sup> 8				620 Drakonia 13 <sup>m</sup> 3			
5	23	17 45.8	7.8	5	23	17 50.2	6.8
	31	17 38.0	9.2		31	17 43.4	8.4
6	8	17 28.8	9.8	6	8	17 35.0	9.4
	16	17 19.0	9.6		16	17 25.6	9.3
	24	17 09.4	8.6		24	17 16.3	8.5
7	2	17 00.8		7	2	17 07.8	
1290 Albertine 14 <sup>m</sup> 4				1170 Siva 15 <sup>m</sup> 3			
5	23	17 46.1	7.2	5	23	18 00.2	10.6
	31	17 38.9	8.5		31	17 49.6	12.4
6	8	17 30.4	9.1	6	8	17 37.2	13.5
	16	17 21.3	8.9		16	17 23.7	13.8
	24	17 12.4	8.2		24	17 09.9	12.6
7	2	17 04.2		7	2	16 57.3	
667 Denise 14 <sup>m</sup> 3				529 Preziosa 13 <sup>m</sup> 3			
5	23	17 39.3	5.2	5	23	17 47.1	6.1
	31	17 34.1	5.7		31	17 41.0	7.0
6	8	17 28.4	5.9	6	8	17 34.0	7.4
	16	17 22.5	5.7		16	17 26.6	7.4
	24	17 16.8	5.3		24	17 19.2	7.0
7	2	17 11.5		7	2	17 12.2	
775 Lumiere 14 <sup>m</sup> 0				1229 Tilia 15 <sup>m</sup> 1			
5	23	17 45.5	6.4	5	23	17 45.9	5.4
	31	17 39.1	7.1		31	17 40.5	6.3
6	8	17 32.0	7.5	6	8	17 34.2	6.7
	16	17 24.5	7.2		16	17 27.5	6.7
	24	17 17.3	6.7		24	17 20.8	6.2
7	2	17 10.6		7	2	17 14.6	
50 Virginia 11 <sup>m</sup> 8				188 Menippe 12 <sup>m</sup> 2			
5	23	17 46.7	6.2	5	23	17 46.6	5.5
	31	17 40.5	7.3		31	17 41.1	6.6
6	8	17 33.2	7.9	6	8	17 34.5	7.1
	16	17 25.3	8.0		16	17 27.4	7.2
	24	17 17.3	7.5		24	17 20.2	6.4
7	2	17 09.8		7	2	17 13.8	

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
873 Mechthild				683 Lanzia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	23	17 46.7	5.3 -14 35	5	31	17 58.2	6.5 -22 12
	31	17 41.4	6.6 -14 25	6	8	17 51.7	7.1 -21 30
6	8	17 34.8	7.1 -14 21		16	17 44.6	7.1 -20 48
	16	17 27.7	6.9 -14 22	7	24	17 37.5	6.5 -20 07
	24	17 20.8	6.2 -14 30		2	17 31.0	5.8 -19 28
7	2	17 14.6	-14 44		10	17 25.2	-18 47
			13 <sup>m</sup> 2				12 <sup>m</sup> 3
			4°				78°
			0.352				0.490
			-27'				+4.5
			18 <sup>m</sup> 5				
			0.095				0.318
			1				2
1051 Merope				1395 Aribeda			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	23	17 46.8	4.8 +9 04	5	31	17 59.6	5.8 -19 51
	31	17 42.0	5.4 +9 55	6	8	17 53.8	6.5 -19 28
6	8	17 36.6	5.9 +10 31		16	17 47.3	6.5 -19 07
	16	17 30.7	5.9 +10 50	7	24	17 40.8	6.3 -18 46
	24	17 24.8	5.4 +10 54		2	17 34.5	5.5 -18 26
7	2	17 19.4	+10 41		10	17 29.0	-18 10
			13 <sup>m</sup> 5				14 <sup>m</sup> 8
			319°				315°
			0.472				0.490
			+3'				+13'
			9 <sup>m</sup> 3				9 <sup>m</sup> 2
			0.316				0.317
			1				1
657 Gunlod				690 Wratislavia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	23	17 57.0	7.0 -33 55	5	31	18 00.0	6.0 -21 02
	31	17 50.0	8.1 -33 43	6	8	17 54.0	6.6 -20 35
6	8	17 41.9	8.7 -33 21		16	17 47.4	6.9 -20 09
	16	17 33.2	8.4 -32 50	7	24	17 40.5	6.6 -19 43
	24	17 24.8	7.6 -32 12		2	17 33.9	5.9 -19 18
7	2	17 17.2	-31 27		10	17 28.0	-18 55
			13 <sup>m</sup> 5				11 <sup>m</sup> 9
			69°				280°
			0.404				0.499
			+13'				+19'
			15 <sup>m</sup> 4				8 <sup>m</sup> 5
			0.184				0.331
			1				1*
1011 Laodamia				305 Gordonia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	23	17 58.3	7.3 -16 53	5	31	18 00.3	5.9 -18 32
	31	17 51.0	8.3 -16 51	6	8	17 54.4	6.4 -18 25
6	8	17 42.7	8.5 -16 52		16	17 48.0	6.4 -18 18
	16	17 34.2	8.4 -16 55	7	24	17 41.6	6.1 -18 12
	24	17 25.8	7.7 -17 01		2	17 35.5	5.6 -18 08
7	2	17 18.1	-17 08		10	17 29.9	-18 06
			17 <sup>m</sup> 7				13 <sup>m</sup> 3
			107°				153°
			0.455				0.561
			-1.7				+1'
			6 <sup>m</sup> 0				6 <sup>m</sup> 0
			0.264				0.419
			12*				1
3 Juno				989 Schwassmannia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	31	17 54.0	6.3 -4 59	5	31	18 04.4	6.7 -16 00
6	8	17 47.7	6.8 -4 41	6	8	17 57.7	7.3 -15 25
	16	17 40.9	6.9 -4 32		16	17 50.4	7.6 -14 52
	24	17 34.0	6.7 -4 32	7	24	17 42.8	7.4 -14 21
	2	17 27.3	6.1 -4 39		2	17 35.4	6.8 -13 54
	10	17 21.2	-4 55		10	17 28.6	-13 32
			9 <sup>m</sup> 8				15 <sup>m</sup> 3
			225°				243°
			0.508				0.489
			-4'				+25'
			6 <sup>m</sup> 9				7 <sup>m</sup> 9
			0.351				0.317
			1*				1
368 Haidea				280 Philia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
5	31	17 55.5	5.8 -16 56	5	31	18 05.8	6.8 -33 32
6	8	17 49.7	6.5 -16 26	6	8	17 59.0	7.6 -33 46
	16	17 43.2	6.7 -15 58		16	17 51.4	7.7 -33 54
	24	17 36.5	6.4 -15 34	7	24	17 43.7	7.5 -33 55
	2	17 30.1	5.5 -15 13		2	17 36.2	6.7 -33 49
	10	17 24.6	-14 58		10	17 29.5	-33 38
			12 <sup>m</sup> 6				14 <sup>m</sup> 9
			325°				172°
			0.417				0.514
			+13'				-0.6
			13 <sup>m</sup> 3				
			0.204				0.355
			1*				2*



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1283 1925 SC				593 Titania			
	h	m	°		h	m	°
5 31	18	05.4	-11 53	5 31	18	18.0	-27 18
6 8	18	00.0	-11 46	6 8	18	11.0	-27 55
16	17	54.0	-11 44	16	18	03.2	-28 29
24 <sup>20</sup>	17	47.9	-11 46	24 <sup>22</sup>	17	54.9	-28 59
7 2	17	41.8	-11 53	7 2	17	46.8	-29 24
10	17	36.2	-12 04	10	17	39.4	-29 44
			14 <sup>m</sup> 9				13 <sup>m</sup> 4
			252°				158°
			0.547				0.511
			-5'				-31'
			6 <sup>m</sup> 4				7 <sup>m</sup> 5
			0.402*				0.350
			1				1
1144 Oda				728 Leonisis			
	h	m	°		h	m	°
5 31	18	04.7	-11 02	5 31	18	20.1	-23 35
6 8	18	00.0	-10 56	6 8	18	12.8	-23 55
16	17	54.7	-10 55	16	18	04.3	-24 13
24 <sup>20</sup>	17	49.2	-10 58	24 <sup>22</sup>	17	55.2	-24 29
7 2	17	43.9	-11 05	7 2	17	46.5	-24 43
10	17	39.0	-11 16	10	17	38.8	-24 53
			13 <sup>m</sup> 7				14 <sup>m</sup> 5
			264°				112°
			0.585				0.373
			-1.0				-21'
			0.455				16 <sup>m</sup> 2
			2				0.130
							1
154 Bertha				241 Germania			
	h	m	°		h	m	°
5 31	18	12.1	-46 17	5 31	18	16.8	-24 19
6 8	18	04.2	-47 11	6 8	18	11.1	-24 08
16	17	55.2	-47 53	16	18	04.4	-23 56
24 <sup>20</sup>	17	45.8	-48 20	24 <sup>22</sup>	17	57.4	-23 43
7 2	17	36.6	-48 32	7 2	17	50.4	-23 28
10	17	28.5	-48 29	10	17	44.0	-23 12
			11 <sup>m</sup> 0				11 <sup>m</sup> 0
			61°				297°
			0.485				0.468
			-2.3				+12'
			0.323*				10 <sup>m</sup> 6
			2				0.285*
							1
1335 Demoulina				1124 Stroobantia			
	h	m	°		h	m	°
5 31	18	25.7	-18 57	5 31	18	18.3	-33 29
6 8	18	19.5	-18 51	6 8	18	11.9	-33 53
16	18	11.7	-18 49	16	18	04.4	-34 11
24 <sup>20</sup>	18	03.1	-18 49	24 <sup>22</sup>	17	56.5	-34 21
7 2	17	54.3	-18 51	7 2	17	48.7	-34 23
10	17	46.1	-18 56	10	17	41.7	-34 18
			15 <sup>m</sup> 2				13 <sup>m</sup> 2
			281°				351°
			0.349				0.453
			+0.1				-1.0
			0.088				0.264
			13				13
268 Adorea				791 Ani			
	h	m	°		h	m	°
5 31	18	11.0	-21 16	5 31	18	15.8	-5 23
6 8	18	05.0	-21 20	6 8	18	10.6	-5 32
16	17	58.4	-21 24	16	18	04.5	-5 52
24 <sup>21</sup>	17	51.5	-21 28	24 <sup>22</sup>	17	57.9	-6 23
7 2	17	44.8	-21 33	7 2	17	51.3	-7 03
10	17	38.9	-21 37	10	17	45.2	-7 52
			12 <sup>m</sup> 0				13 <sup>m</sup> 0
			66°				318°
			0.473				0.439
			-8'				-34'
			10 <sup>m</sup> 1				11 <sup>m</sup> 1
			0.292*				0.248
			1				1
606 Brangane				950 Ahrensa			
	h	m	°		h	m	°
5 31	18	15.9	-34 35	5 31	18	18.9	+14 18
6 8	18	08.6	-34 40	6 8	18	12.5	+15 08
16	18	00.1	-34 37	16	18	05.3	+15 35
24 <sup>21</sup>	17	50.9	-34 23	24 <sup>22</sup>	17	57.8	+15 36
7 2	17	41.9	-34 00	7 2	17	50.5	+15 13
10	17	33.8	-33 28	10	17	44.1	+14 26
			13 <sup>m</sup> 0				13 <sup>m</sup> 4
			279°				83°
			0.420				0.376
			+8'				-5'
			13 <sup>m</sup> 9				14 <sup>m</sup> 0
			0.212				0.177*
			1				1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1440 Rostia 15 <sup>m</sup> 9				942 Romilda 14 <sup>m</sup> 2			
5	31	18 18.0	5.7 -25 24	7	249°		
6	8	18 12.3	6.4 -25 31	5	0.540		
	16	18 05.9	6.8 -25 36	4	-2		
	24	17 59.1	6.8 -25 40	2	7 <sup>m</sup> 2		
7	2	17 52.3	6.4 -25 42	1	0.388		
	10	17 45.9	-25 41		7*		
1504 1939 FM 15 <sup>m</sup> 8				1191 1931 CA 13 <sup>m</sup> 7			
5	31	18 24.8	7.1 -20 20	34	109°		
6	8	18 17.7	8.2 -20 54	35	0.411		
	16	18 09.5	8.7 -21 29	35	-2.6		
	24	18 00.8	8.6 -22 04	35			
7	2	17 52.2	7.7 -22 39	31	0.193		
	10	17 44.5	-23 10		12*		
708 Raphaela 13 <sup>m</sup> 1				936 Kunigunde 12 <sup>m</sup> 6			
5	31	18 23.8	6.6 -28 53	10	71°		
6	8	18 17.2	7.6 -29 03	7	0.417		
	16	18 09.6	8.1 -29 10	1	-1		
	24	18 01.5	7.9 -29 11	4	14 <sup>m</sup> 1		
7	2	17 53.6	7.2 -29 07	10	0.205		
	10	17 46.4	-28 57		1		
249 Ilse 13 <sup>m</sup> 8				14 Irene 9 <sup>m</sup> 5			
5	31	18 28.5	7.4 -38 06	20	280°		
6	8	18 21.1	9.1 -38 26	9	0.383		
	16	18 12.0	10.1 -38 35	4	+6		
	24	18 01.9	10.3 -38 31	18	17 <sup>m</sup> 8		
7	2	17 51.6	9.4 -38 13	31	0.154		
	10	17 42.2	-37 42		1*		
743 Eugenisia 13 <sup>m</sup> 2				410 Chloris 10 <sup>m</sup> 2			
5	31	18 25.2	5.8 -19 04	12	223°		
6	8	18 19.4	6.7 -18 52	11	0.465		
	16	18 12.7	7.1 -18 41	9	+1.2		
	24	18 05.6	7.1 -18 32	7			
7	2	17 58.5	6.7 -18 25	5	0.281		
	10	17 51.8	-18 20		2		
1288 Santa 14 <sup>m</sup> 7				506 Marion 13 <sup>m</sup> 2			
6	8	18 24.2	7.0 -29 19	7	288°		
	16	18 17.2	7.6 -29 12	13	0.453		
	24	18 09.6	7.7 -28 59	18	+1.5		
7	2	18 01.9	7.2 -28 41	23			
	10	17 54.7	6.2 -28 18	25	0.262		
	18	17 48.5	-27 53		13		
6	8	18 26.8	6.4 -27 52	26	258°		
	16	18 20.4	7.0 -28 18	23	0.524		
	24	18 13.4	7.1 -28 41	20	-19		
7	2	18 06.3	6.9 -29 01	15	8 <sup>m</sup> 0		
	10	17 59.4	6.2 -29 16	12	0.367		
	18	17 53.2	-29 28		1		
6	8	18 27.0	6.2 -3 13	18	89°		
	16	18 20.8	6.6 -3 31	30	0.462		
	24	18 14.2	6.7 -4 01	39	-31		
7	2	18 07.5	6.4 -4 40	49	9 <sup>m</sup> 5		
	10	18 01.1	5.6 -5 29	56	0.283		
	18	17 55.5	-6 25		1		
6	8	18 32.5	8.2 -24 58	15	332°		
	16	18 24.3	9.3 -25 13	12	0.389		
	24	18 15.0	9.5 -25 25	9	-8		
7	2	18 05.5	9.0 -25 34	6	14 <sup>m</sup> 3		
	10	17 56.5	7.8 -25 40	2	0.157		
	18	17 48.7	-25 42		1		
6	8	18 36.1	7.3 -23 42	37	74°		
	16	18 28.8	8.2 -24 19	36	0.405		
	24	18 20.6	8.2 -24 55	33	-28		
7	2	18 12.4	7.7 -25 28	29	14 <sup>m</sup> 2		
	10	18 04.7	6.7 -25 57	25	0.183		
	18	17 58.0	-26 22		1*		
6	8	18 33.8	5.7 -19 43	63	4°		
	16	18 28.1	6.7 -20 46	67	0.317		
	24	18 21.4	7.0 -21 53	68	-63		
7	2	18 14.4	6.7 -23 01	66	24 <sup>m</sup> 3		
	10	18 07.7	5.5 -24 07	61	0.026		
	18	18 02.2	-25 08		1*		
6	8	18 37.7	7.5 -39 13	3	172°		
	16	18 30.2	8.0 -39 10	11	0.541		
	24	18 22.2	8.2 -38 59	19	+22		
7	2	18 14.0	7.8 -38 40	28	7 <sup>m</sup> 8		
	10	18 06.2	7.0 -38 12	35	0.395		
	18	17 59.2	-37 37		1		

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1245 Calvinia				973 Aralia			
	h	m	°		h	m	°
6	8	18 35.1	6.1 -19 23	5	286°		
	16	18 29.0	6.8 -19 28	6	0.455		
	24	18 22.2	7.1 -19 34	7	-1		
7	2 <sup>27</sup>	18 15.1	6.8 -19 41	8	10 <sup>m</sup> 8		
	10	18 08.3	6.1 -19 49	9	0.263		
	18	18 02.2	-19 58	1	*		
915 Cosette				1004 Belopolskya			
	h	m	°		h	m	°
6	8	18 45.2	8.1 -32 09	24	250°		
	16	18 37.1	9.3 -32 33	17	0.384		
	24	18 27.8	9.9 -32 50	8	+11		
7	2 <sup>28</sup>	18 17.9	9.6 -32 58	2	16 <sup>m</sup> 4		
	10	18 08.3	8.6 -32 56	11	0.149		
	18	17 59.7	-32 45	7	*		
596 Scheila				655 Briseis			
	h	m	°		h	m	°
6	8	18 42.4	6.5 -31 01	66	22°		
	16	18 35.9	7.7 -32 07	61	0.397		
	24	18 28.2	8.1 -33 08	52	-2.3		
7	2 <sup>28</sup>	18 20.1	7.7 -34 00	42			
	10	18 12.4	6.9 -34 42	32	0.174		
	18	18 05.5	-35 14	2			
1087 Arabis				772 Tanete			
	h	m	°		h	m	°
6	8	18 44.7	6.7 -35 41	28	227°		
	16	18 38.0	7.5 -36 09	22	0.506		
	24	18 30.5	7.9 -36 31	13	-0.4		
7	2 <sup>28</sup>	18 22.6	7.7 -36 44	6			
	10	18 14.9	7.0 -36 50	3	0.345		
	18	18 07.9	-36 47	5			
817 Annika				941 Murray			
	h	m	°		h	m	°
6	8	18 45.9	6.3 -13 30	17	244°		
	16	18 39.6	7.1 -13 47	23	0.457		
	24	18 32.5	7.6 -14 10	27	-17		
7	2 <sup>29</sup>	18 24.9	7.5 -14 37	32	9 <sup>m</sup> 6		
	10	18 17.4	7.0 -15 09	34	0.269		
	18	18 10.4	-15 43	1			
1513 1940 EB				19 Fortuna			
	h	m	°		h	m	°
6	8	18 48.6	7.4 -18 00	13	104°		
	16	18 41.2	8.4 -18 13	17	0.354		
	24	18 32.8	8.8 -18 30	19	-6		
7	2 <sup>29</sup>	18 24.0	8.5 -18 49	22	17 <sup>m</sup> 4		
	10	18 15.5	7.3 -19 11	21	0.097		
	18	18 08.2	-19 32	1	*		
6	8	18 48.4	7.2 -44 10	18	199°		
	16	18 41.2	8.0 -44 28	9	0.540		
	24	18 33.2	8.3 -44 37	3	+10		
7	2 <sup>29</sup>	18 24.9	8.1 -44 34	14	9 <sup>m</sup> 1		
	10	18 16.8	7.3 -44 20	23	0.398		
	18	18 09.5	-43 57	1			
6	8	18 46.1	5.2 -19 24	5	286°		
	16	18 40.9	6.0 -19 29	6	0.528		
	24	18 34.9	6.2 -19 35	7	+0.4		
7	2 <sup>29</sup>	18 28.7	6.1 -19 42	8			
	10	18 22.6	5.7 -19 50	8	0.373		
	18	18 16.9	-19 58	2			
6	8	18 47.8	5.6 -17 22	11	235°		
	16	18 42.2	6.4 -17 33	14	0.498		
	24	18 35.8	6.7 -17 47	15	-5		
7	2 <sup>30</sup>	18 29.1	6.7 -18 02	18	8 <sup>m</sup> 5		
	10	18 22.4	6.1 -18 20	19	0.331		
	18	18 16.3	-18 39	1			
6	8	18 54.9	8.1 -44 22	93	62°		
	16	18 46.8	9.4 -45 55	81	0.459		
	24	18 37.4	10.3 -47 16	64	-54		
7	2 <sup>30</sup>	18 27.1	10.3 -48 20	47	13 <sup>m</sup> 5		
	10	18 16.8	9.4 -49 07	30	0.284		
	18	18 07.4	-49 37	1	*		
6	8	18 51.4	6.3 -29 17	27	273°		
	16	18 45.1	7.5 -29 44	26	0.457		
	24	18 37.6	8.0 -30 10	20	-8		
7	2 <sup>30</sup>	18 29.6	8.0 -30 30	15	11 <sup>m</sup> 3		
	10	18 21.6	7.6 -30 45	8	0.269		
	18	18 14.0	-30 53	1			
6	8	18 52.7	6.5 -20 46	1	263°		
	16	18 46.2	7.6 -20 47	4	0.408		
	24	18 38.6	8.3 -20 51	4	+10		
7	2 <sup>30</sup>	18 30.3	8.2 -20 55	4	13 <sup>m</sup> 2		
	10	18 22.1	7.6 -20 59	3	0.189		
	18	18 14.5	-21 02	1	*		

1947		$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947		$\alpha_{1950}$	$\delta_{1950}$	Misc.					
758 Mancunia					1010 Marlene									
		h	m	°			h	m	°					
6	8	18	50.4	5.5 -21 24	13	219°	6	16	18	57.6	6.5 -22 31	17	276°	
	16	18	44.9	6.1 -21 37	15	0.550,		24	18	51.1	6.9 -22 48	18	0.466,	
	24	18	38.8	6.4 -21 52	14	-0.4	7	2	18	44.2	7.2 -23 06	17	0.0	
7	2	18	32.4	6.4 -22 06	14			10	18	37.0	6.8 -23 23	15		
	10	18	26.0	6.0 -22 20	13	0.403		18	18	30.2	5.9 -23 38	13	0.282	
	18	18	20.0	-22 33	2			26	18	24.3	-23 51	5		
54 Alexandra					934 Thuringia									
		h	m	°			h	m	°					
6	8	18	54.7	6.5 -37 30	8	347°	6	16	19	01.4	8.4 -39 26	3	275°	
	16	18	48.2	8.0 -37 22	22	0.343		24	18	53.0	9.2 -39 29	6	0.451,	
	24	18	40.2	8.7 -37 00	35	+51'	7	2	18	43.8	9.4 -39 23	19	+25,	
7	2	18	31.5	8.4 -36 25	50	23.5		10	18	34.4	8.9 -39 04	32	12.2	
	10	18	23.1	7.3 -35 35	60	0.081*		18	18	25.5	7.7 -38 32	40	0.264	
	18	18	15.8	-34 35	1			26	18	17.8	-37 52	1		
862 Franzia					1090 Sumida									
		h	m	°			h	m	°					
6	8	18	57.5	7.0 -32 01	8	223°	6	16	18	59.3	7.1 + 2 41	21	142°	
	16	18	50.5	7.8 -31 53	14	0.475,		24	18	52.2	7.7 + 2 20	34	0.448,	
	24	18	42.7	8.3 -31 39	21	+3.6	7	2	18	44.5	7.7 + 1 46	48	-25,	
7	2	18	34.4	8.1 -31 18	27			10	18	36.8	7.2 + 0 58	60	8.9	
	10	18	26.3	7.5 -30 51	32	0.295		18	18	29.6	6.4 - 0 02	70	0.268*	
	18	18	18.8	-30 19	2			26	18	23.2	- 1 12	1		
1497 1938 SB <sub>1</sub>					45 Eugenia									
		h	m	°			h	m	°					
6	8	18	51.2	5.8 -23 45	5	321°	6	16	19	00.1	6.4 -14 14	15	42°	
	16	18	45.4	6.8 -23 50	4	0.433,		24	18	53.7	7.0 -14 29	20	0.409,	
	24	18	38.6	7.2 -23 54	3	+1.1	7	2	18	46.7	7.0 -14 49	25	-3,	
7	2	18	31.4	7.2 -23 57	2			10	18	39.7	6.6 -15 14	29	13.5	
	10	18	24.2	6.5 -23 59	0	0.230		18	18	33.1	5.6 -15 43	30	0.191*	
	18	18	17.7	-23 59	12			26	18	27.5	-16 13	1		
653 Berenike					182 Elsa									
		h	m	°			h	m	°					
6	8	18	52.2	5.4 -12 19	15	84°	6	16	19	02.6	7.4 -22 06	16	242°	
	16	18	46.8	6.2 -12 34	21	0.477,		24	18	55.2	8.2 -22 22	15	0.430,	
	24	18	40.6	6.5 -12 55	27	-15'	7	2	18	47.0	8.5 -22 37	14	+4,	
7	2	18	34.1	6.5 -13 22	30	9.3		10	18	38.5	8.0 -22 51	13	11.5	
	10	18	27.6	6.0 -13 52	34	0.301		18	18	30.5	7.2 -23 04	10	0.224*	
	18	18	21.6	-14 26	1			26	18	23.3	-23 14	1		
1437 Diomedes					1289 Kuttaissi									
		h	m	°			h	m	°					
6	16	18	53.9	5.0 -38 42	3	199°	6	16	19	00.8	6.3 -20 14	6	335°	
	24	18	48.9	5.3 -38 39	6	0.728,		24	18	54.5	7.0 -20 20	7	0.432,	
	7	2	18	43.6	5.4 -38 33	10	+4.7	7	2	18	47.5	6.9 -20 27	8	+1.1
	10	18	38.2	5.1 -38 23	15			10	18	40.6	6.9 -20 35	8		
	18	18	33.1	4.6 -38 08	21	0.640		18	18	33.7	5.8 -20 43	7	0.227	
	26	18	28.5	-37 47	2			26	18	27.9	-20 50	5		

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1308 Halleria				1324 Knysna			
	h	m	°		h	m	°
6 16	19 05.2	6.9	-30 41	13	267°		
24	18 58.3	7.5	-30 54	9	0.464,		
7 2	18 50.8	7.6	-31 03	2	+1.5		
10	18 43.2	7.3	-31 05	3			
18	18 35.9	6.4	-31 02	9	0.279		
26	18 29.5		-30 53	5			
396 Aeolia				478 Tergeste			
	h	m	°		h	m	°
6 16	19 04.3	6.2	-20 44	3	10°		
24	18 58.1	7.0	-20 41	2	0.364,		
7 2	18 51.1	7.3	-20 39	1	+1.7		
10	18 43.8	6.6	-20 38	0			
18	18 37.2	5.5	-20 38	0	0.114		
26	18 31.7		-20 38	2			
129 Antigone				748 Simeisa			
	h	m	°		h	m	°
6 16	19 04.8	5.7	-8 58	35	24°		
24	18 59.1	6.4	-9 33	45	0.372,		
7 2	18 52.7	6.6	-10 18	53	-1.4		
10	18 46.1	6.1	-11 11	61			
18	18 40.0	5.2	-12 12	64	0.132*		
26	18 34.8		-13 16	2			
1260 Walhalla				1252 Celestia			
	h	m	°		h	m	°
6 16	19 09.5	7.5	-28 36	5	310°		
24	19 02.0	8.3	-28 31	10	0.406,		
7 2	18 53.7	8.5	-28 21	16	+45'		
10	18 45.2	8.1	-28 05	21	14 <sup>m</sup> 3		
18	18 37.1	6.9	-27 44	25	0.185*		
26	18 30.2		-27 19	7			
355 Gabriella				847 Agnia			
	h	m	°		h	m	°
6 16	19 11.2	7.4	-28 50	15	186°		
24	19 03.8	8.2	-29 05	11	0.445,		
7 2	18 55.6	8.4	-29 16	6	+13'		
10	18 47.2	8.0	-29 22	0	11 <sup>m</sup> 4		
18	18 39.2	7.1	-29 22	6	0.250*		
26	18 32.1		-29 16	1			
1165 Imprinetta				346 Hermentaria			
	h	m	°		h	m	°
6 16	19 06.4	5.0	-2 48	30	351°		
24	19 01.4	5.8	-2 18	17	0.397,		
7 2	18 55.6	6.1	-2 01	4	+32'		
10	18 49.5	5.8	-1 57	10	14 <sup>m</sup> 3		
18	18 43.7	5.0	-2 07	22	0.181		
26	18 38.7		-2 29	1			
6 16	19 12.0	6.8	-27 24	13	7°		
24	19 05.2	8.0	-27 11	18	0.263,		
7 2	18 57.2	8.3	-26 53	24	+2.3		
10	18 48.9	7.6	-26 29	30			
18	18 41.3	6.1	-25 59	33	9.914		
26	18 35.2		-25 26	5			
6 16	19 12.6	5.8	-8 46	20	166°		
24	19 06.8	6.3	-8 26	14	0.514,		
7 2	19 00.5	6.5	-8 12	8	+27'		
10	18 54.0	6.4	-8 04	1	7 <sup>m</sup> 3		
18	18 47.6	5.7	-8 03	5	0.356*		
26	18 41.9		-8 08	1			
6 16	19 12.3	4.7	-21 37	6	200°		
24	19 07.6	5.1	-21 43	6	0.665,		
7 2	19 02.5	5.3	-21 49	5	+1.9		
10	18 57.2	5.2	-21 54	5			
18	18 52.0	4.8	-21 59	4	0.557		
26	18 47.2		-22 03	2			
6 16	19 18.6	6.6	+15 05	52	54°		
24	19 12.0	7.4	+14 13	77	0.392,		
7 2	19 04.6	7.6	+12 56	100	-6.2		
10	18 57.0	7.3	+11 16	121			
18	18 49.7	6.4	+9 15	136	0.194		
26	18 43.3		+6 59	5			
6 16	19 17.7	6.2	-21 46	4	256°		
24	19 11.5	7.1	-21 50	5	0.458,		
7 2	19 04.4	7.4	-21 55	4	+20'		
10	18 57.0	7.2	-21 59	4	10 <sup>m</sup> 5		
18	18 49.8	6.6	-22 03	2	0.269		
26	18 43.2		-22 05	1			
6 16	19 19.1	6.1	-23 50	36	274°		
24	19 13.0	7.0	-24 26	37	0.448,		
7 2	19 06.0	7.5	-25 03	34	+0.5		
10	18 58.5	7.4	-25 37	32			
18	18 51.1	6.7	-26 09	27	0.255*		
26	18 44.4		-26 36	2			

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
390 Alma				652 Jubilatrix			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 22.0	7.5	-30 21	4	141°		
24	19 14.5	8.3	-30 17	9	0.468		
7 2	19 06.2	8.5	-30 08	14	+38'		
10	18 57.7	8.3	-29 54	20	10 <sup>m</sup> 0		
18	18 49.4	7.4	-29 34	26	0.286		
26	18 42.0		-29 08	1			
63 Ausonia				1332 Marconia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 24.1	6.8	-31 37	12	10°		
24	19 17.3	8.1	-31 49	4	0.322		
7 2	19 09.2	8.7	-31 53	6	+2.2		
10	19 00.5	8.3	-31 47	16			
18	18 52.2	7.2	-31 31	25	0.038*		
26	18 45.0		-31 06	2			
147 Protogeneia				52 Europa			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 21.2	5.6	-20 46	5	294°		
24	19 15.6	6.2	-20 51	7	0.493		
7 2	19 09.4	6.7	-20 58	6	+16'		
10	19 02.7	6.5	-21 04	7	9 <sup>m</sup> 1		
18	18 56.2	6.0	-21 11	5	0.322*		
26	18 50.2		-21 16	1			
138 Tolosa				926 Imhilde			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 24.5	5.5	-26 02	32	340°		
24	19 19.0	7.1	-26 34	30	0.320		
7 2	19 11.9	7.8	-27 04	25	+15'		
10	19 04.1	7.7	-27 29	21	24 <sup>m</sup> 5		
18	18 56.4	6.9	-27 50	12	0.032*		
26	18 49.5		-28 02	1			
1253 Frisia				1538 1940 RF			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 25.5	5.5	-23 40	14	273°		
24	19 20.0	6.3	-23 54	14	0.513		
7 2	19 13.7	6.8	-24 08	13	+11'		
10	19 06.9	6.8	-24 21	11	8 <sup>m</sup> 3		
18	19 00.1	6.5	-24 32	8	0.352		
26	18 53.6		-24 40	1			
1047 Geisha				523 Ada			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
6 16	19 32.2	6.2	-25 17	45	291°		
24	19 26.0	7.9	-26 02	45	0.339		
7 2	19 18.1	8.9	-26 47	43	+1'		
10	19 09.2	9.3	-27 30	38	20 <sup>m</sup> 7		
18	18 59.9	8.7	-28 08	29	0.069		
26	18 51.2		-28 37	1			
6 16	19 31.6	6.0	-27 43	76	298°		
24	19 25.6	7.5	-28 59	78	0.388		
7 2	19 18.1	8.3	-30 17	72	-35'		
10	19 09.8	8.6	-31 29	65	16 <sup>m</sup> 5		
18	19 01.2	8.1	-32 34	55	0.158		
26	18 53.1		-33 29	1			
6 24	19 27.1	6.4	-25 44	17	304°		
7 2	19 20.7	6.9	-26 01	13	0.460		
10	19 13.8	7.2	-26 14	11	+15'		
18	19 06.6	6.6	-26 25	6	11 <sup>m</sup> 1		
26	19 00.0	5.7	-26 31	3	0.272		
8 3	18 54.3		-26 34	1			
6 24	19 26.4	6.0	-17 35	21	177°		
7 2	19 20.4	6.3	-17 56	23	0.535		
10	19 14.1	6.3	-18 19	24	0'		
18	19 07.8	6.1	-18 43	24	7 <sup>m</sup> 1		
26	19 01.7	5.3	-19 07	24	0.382*		
8 3	18 56.4		-19 31	1			
6 24	19 33.6	7.8	-42 31	55	49°		
7 2	19 25.8	8.7	-43 26	42	0.430		
10	19 17.1	8.7	-44 08	27	-9'		
18	19 08.4	8.0	-44 35	9	16 <sup>m</sup> 1		
26	19 00.4	6.5	-44 44	4	0.236		
8 3	18 53.9		-44 40	1			
6 24	19 35.8	8.3	-37 27	17	313°		
7 2	19 27.5	9.7	-37 44	2	0.320		
10	19 17.8	10.0	-37 46	14	+42'		
18	19 07.8	9.3	-37 32	31	25 <sup>m</sup> 4		
26	18 58.5	7.7	-37 01	46	0.037		
8 3	18 50.8		-36 15	1			
6 24	19 31.5	6.2	-19 20	5	209°		
7 2	19 25.3	6.7	-19 25	6	0.537		
10	19 18.6	6.8	-19 31	6	+18'		
18	19 11.8	6.4	-19 37	6	6 <sup>m</sup> 6		
26	19 05.4	5.8	-19 43	6	0.386		
8 3	18 59.6		-19 49	1			



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1490 1936 LB 12 <sup>m</sup> 5				975 Perseverantia 13 <sup>m</sup> 1			
6	24	19 34.6	7.0 -12 37 45	6	24	19 44.9	6.4 -24 52 21
7	2	19 27.6	8.0 -11 52 37	7	2	19 38.5	7.1 -25 13 20
10	11	19 19.6	8.2 -11 15 30	10	13	19 31.4	7.3 -25 33 17
18	11	19 11.4	7.7 -10 45 21	18	13	19 24.1	7.1 -25 50 12
26	19	19 03.7	6.6 -10 24 13	26	19	19 17.0	6.4 -26 02 9
8	3	18 57.1	-10 11 13	8	3	19 10.6	-26 11 2
1210 Morosovia 13 <sup>m</sup> 2				856 Backlunda 13 <sup>m</sup> 2			
6	24	19 36.2	5.9 -20 53 44	6	24	19 45.8	6.6 -12 43 57
7	2	19 30.3	6.6 -21 37 45	7	2	19 39.2	7.4 -13 40 66
10	12	19 23.7	6.9 -22 22 44	10	14	19 31.8	7.8 -14 46 70
18	12	19 16.8	6.4 -23 06 41	18	14	19 24.0	7.4 -15 56 71
26	19	19 10.4	5.8 -23 47 38	26	19	19 16.6	6.5 -17 07 69
8	3	19 04.6	-24 25 1	8	3	19 10.1	-18 16 1
1309 Hyperborea 14 <sup>m</sup> 6				398 Admete 14 <sup>m</sup> 6			
6	24	19 35.1	5.3 -7 55 1	6	24	19 46.8	6.6 -19 37 3
7	2	19 29.8	5.8 -7 54 5	7	2	19 40.2	7.2 -19 34 3
10	12	19 24.0	5.9 -7 59 11	10	14	19 33.0	7.6 -19 31 2
18	12	19 18.1	5.7 -8 10 15	18	14	19 25.4	7.4 -19 29 1
26	19	19 12.4	5.2 -8 25 20	26	19	19 18.0	6.7 -19 28 3
8	3	19 07.2	-8 45 1	8	3	19 11.3	-19 25 1
588 Achilles 15 <sup>m</sup> 0				146 Lucina 10 <sup>m</sup> 9			
6	24	19 34.7	4.1 -27 39 5	6	24	19 52.7	6.4 -28 37 64
7	2	19 30.6	4.4 -27 44 4	7	2	19 46.3	7.4 -29 41 59
10	12	19 26.2	4.4 -27 48 2	10	15	19 38.9	7.8 -30 40 54
18	12	19 21.8	4.3 -27 50 1	18	15	19 31.1	7.7 -31 34 43
26	19	19 17.5	4.1 -27 51 2	26	19	19 23.4	6.8 -32 17 34
8	3	19 13.4	-27 49 2	8	3	19 16.6	-32 51 1
623 Chimaera 13 <sup>m</sup> 2				360 Carlova 12 <sup>m</sup> 3			
6	24	19 47.3	8.3 -30 27 7	6	24	19 50.8	5.5 -14 15 27
7	2	19 39.0	9.1 -30 20 14	7	2	19 45.3	6.1 -14 42 32
10	13	19 29.9	9.4 -30 06 21	10	15	19 39.2	6.5 -15 14 35
18	13	19 20.5	9.0 -29 45 28	18	15	19 32.7	6.5 -15 49 37
26	19	19 11.5	7.9 -29 17 35	26	19	19 26.2	6.0 -16 26 38
8	3	19 03.6	-28 42 1	8	3	19 20.2	-17 04 2
130 Elektra 10 <sup>m</sup> 4				1353 Maartje 13 <sup>m</sup> 0			
6	24	19 41.5	5.3 -0 23 29	6	24	19 50.8	5.2 -7 13 10
7	2	19 36.2	5.9 -0 52 41	7	2	19 45.6	6.1 -7 03 1
10	13	19 30.3	6.3 -1 33 53	10	15	19 39.5	6.3 -7 02 8
18	13	19 24.0	6.2 -2 26 64	18	15	19 33.2	6.3 -7 10 16
26	19	19 17.8	5.8 -3 30 72	26	19	19 26.9	5.7 -7 26 23
8	3	19 12.0	-4 42 1	8	3	19 21.2	-7 49 1

1947		$\alpha_{1950}$		$\delta_{1950}$		Misc.	
895 Helio							13 <sup>m</sup> 6
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	19	53.7	5.8	- 3	40	215°
7	2	19	47.9	6.3	- 3	04	0.555
	10	19	41.6	6.7	- 2	34	+49'
	18	19	34.9	6.5	- 2	12	5 <sup>m</sup> 1
	26	19	28.4	6.2	- 1	58	0.419
8	3	19	22.2		- 1	50	1
139 Juewa							11 <sup>m</sup> 3
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	19	58.0	7.5	-36	41	107°
7	2	19	50.5	8.3	-37	07	0.476
	10	19	42.2	8.6	-37	25	+28'
	18	19	33.6	8.3	-37	33	10 <sup>m</sup> 7
	26	19	25.3	7.5	-37	30	0.301
8	3	19	17.8		-37	17	1*
1230 Riceia							15 <sup>m</sup> 5
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	19	58.6	5.4	- 3	49	289°
7	2	19	53.2	6.4	- 3	35	0.400
	10	19	46.8	7.1	- 3	32	+35'
	18	19	39.7	7.3	- 3	43	13 <sup>m</sup> 0
	26	19	32.4	6.7	- 4	05	0.186
8	3	19	25.7		- 4	37	1
1217 Maximiliana							14 <sup>m</sup> 4
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	20	02.8	5.7	-14	01	42°
7	2	19	57.1	6.9	-14	29	0.324
	10	19	50.2	7.6	-15	05	+1.1
	18	19	42.6	7.5	-15	47	
	26	19	35.1	6.5	-16	32	0.033
8	3	19	28.6		-17	18	13
1511 Dalera							15 <sup>m</sup> 3
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	20	05.2	6.6	-23	19	105°
7	2	19	58.6	7.9	-23	55	0.388
	10	19	50.7	8.4	-24	32	+29'
	18	19	42.3	8.3	-25	06	14 <sup>m</sup> 7
	26	19	34.0	7.5	-25	35	0.156
8	3	19	26.5		-25	57	7*
371 Bohemia							11 <sup>m</sup> 4
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	19	59.9	7.1	-19	08	27°
	10	19	52.8	7.6	-19	01	0.411
	18	19	45.2	7.5	-18	55	+4.3
	26	19	37.7	6.9	-18	50	
8	3	19	30.8	5.8	-18	45	0.196
	11	19	25.0		-18	39	2
888 Parysatis							13 <sup>m</sup> 4
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
6	24	20	05.3	5.5	-15	20	254°
7	2	19	59.8	6.4	-15	59	0.469
	10	19	53.4	7.0	-16	44	-10'
	18	19	46.4	7.2	-17	33	9 <sup>m</sup> 4
	26	19	39.2	7.0	-18	24	0.285
8	3	19	32.2		-19	14	1
1061 Paeonia							15 <sup>m</sup> 0
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	20	01.6	5.9	-21	59	267°
	10	19	55.7	6.5	-22	22	0.528
	18	19	49.2	6.6	-22	43	+13'
	26	19	42.6	6.3	-23	04	7 <sup>m</sup> 4
8	3	19	36.3	5.7	-23	22	0.372
	11	19	30.6		-23	37	1
992 Swasey							14 <sup>m</sup> 6
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	20	01.6	5.8	- 4	32	91°
	10	19	55.8	6.2	- 4	34	0.485
	18	19	49.6	6.3	- 4	43	+25'
	26	19	43.3	5.9	- 5	01	8 <sup>m</sup> 5
8	3	19	37.4	5.2	- 5	25	0.315
	11	19	32.2		- 5	55	1
392 Wilhelmina							11 <sup>m</sup> 8
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	20	03.2	5.7	+ 1	25	292°
	10	19	57.5	6.3	+ 1	37	0.445
	18	19	51.2	6.6	+ 1	35	+33'
	26	19	44.6	6.2	+ 1	20	10 <sup>m</sup> 2
8	3	19	38.4	5.5	+ 0	54	0.261
	11	19	32.9		+ 0	17	1
491 Carina							12 <sup>m</sup> 7
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	20	03.4	5.1	+ 2	57	247°
	10	19	58.3	5.6	+ 2	44	0.518
	18	19	52.7	5.8	+ 2	20	+2'
	26	19	46.9	5.5	+ 1	45	7 <sup>m</sup> 3
8	3	19	41.4	4.9	+ 1	00	0.369
	11	19	36.5		+ 0	08	1
364 Isara							12 <sup>m</sup> 0
		<sup>h</sup>	<sup>m</sup>		<sup>o</sup>	<sup>'</sup>	
7	2	20	08.8	7.4	-21	10	254°
	10	20	01.4	8.4	-21	55	0.372
	18	19	53.0	8.8	-22	43	+12'
	26	19	44.2	8.4	-23	28	15 <sup>m</sup> 9
8	3	19	35.8	7.3	-24	09	0.127
	11	19	28.5		-24	43	1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$		$\delta_{1950}$		Misc.	1947	$\alpha_{1950}$		$\delta_{1950}$		Misc.			
316 Goberta						1100 Arnica								
7	2	20	05.5	5.7	-19 44	21	2	20	12.1	6.1	-20 22	16	336°	
	10	19	59.8	6.2	-20 05	20	10	20	06.0	6.8	-20 38	17	0.435	
	18	20	19	53.6	6.3	-20 25	21	18	19	59.2	7.0	-20 55	16	+33'
	26	19	47.3	6.1	-20 46	19	26	19	52.2	6.7	-21 11	14	12.0	
8	3	19	41.2	5.4	-21 05	17	8	3	19	45.5	5.8	-21 25	11	0.233
	11	19	35.8		-21 22	1		11	19	39.7		-21 36	1	
1478 1938 CF						837 Schwarzschilda								
7	2	20	11.1	7.8	-25 50	8	7	2	20	13.5	6.5	-8 01	5	291°
	10	20	03.3	8.5	-25 58	5	10	20	07.0	7.4	-8 06	16	0.356	
	18	20	19	54.8	8.6	-26 03	1	18	19	59.6	7.7	-8 22	27	+43'
	26	19	46.2	8.1	-26 02	6	26	19	51.9	7.4	-8 49	33	16.6	
8	3	19	38.1	7.1	-25 56	11	8	3	19	44.5	6.5	-9 22	39	0.103
	11	19	31.0		-25 45	12		11	19	38.0		-10 01	1	
517 Edith						749 Malzovia								
7	2	20	07.4	5.8	-18 47	11	7	2	20	22.0	6.5	-19 40	56	45°
	10	20	01.6	6.4	-18 58	12	10	20	15.5	7.7	-20 36	58	0.302	
	18	20	19	55.2	6.6	-19 10	12	18	20	07.8	8.0	-21 34	55	+32'
	26	19	48.6	6.4	-19 22	12	26	19	59.8	7.4	-22 29	50	25.2	
8	3	19	42.2	5.8	-19 34	10	8	3	19	52.4	6.1	-23 19	40	9.995*
	11	19	36.4		-19 44	1		11	19	46.3		-23 59	1	
1562 1943 EE						1296 Andree								
7	2	20	10.8	7.2	-17 13	41	7	2	20	22.2	6.6	-13 27	11	203°
	10	20	03.6	8.0	-17 54	45	10	20	15.6	7.5	-13 38	16	0.440	
	18	20	19	55.6	8.3	-18 39	45	18	20	08.1	7.8	-13 54	19	+37'
	26	19	47.3	7.6	-19 24	43	26	19	00.3	7.6	-14 13	22	10.3	
8	3	19	39.7	6.3	-20 07	39	8	3	19	52.7	7.0	-14 35	23	0.238*
	11	19	33.4		-20 46	1		11	19	45.7		-14 58	7	
1377 Roberbauxa						595 Polyxena								
7	2	20	10.7	7.1	-9 45	0	7	2	20	24.1	7.3	-46 24	40	15°
	10	20	03.6	7.9	-9 45	10	10	20	16.8	8.4	-47 04	28	0.473	
	18	20	19	55.7	8.1	-9 55	18	18	20	08.4	8.6	-47 32	12	+25'
	26	19	47.6	7.4	-10 13	25	26	19	59.8	8.3	-47 44	4	13.7	
8	3	19	40.2	6.2	-10 38	29	8	3	19	51.5	7.3	-47 40	20	0.307*
	11	19	34.0		-11 07	7		11	19	44.2		-47 20	1	
1268 Libya						180 Garumna								
7	2	20	09.4	5.1	-25 07	15	7	2	20	24.8	6.1	-19 44	19	172°
	10	20	04.3	5.4	-25 22	13	10	20	18.7	6.9	-20 03	21	0.502	
	18	20	19	58.9	5.5	-25 35	11	18	20	11.8	7.2	-20 24	20	+24'
	26	19	53.4	5.3	-25 46	9	26	19	04.6	7.1	-20 44	18	7.9	
8	3	19	48.1	4.9	-25 55	6	8	3	19	57.5	6.5	-21 02	16	0.335*
	11	19	43.2		-26 01	2		11	19	51.0		-21 18	1	

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
537 Pauly				509 Iolanda			
			11 <sup>m</sup> 6				11 <sup>m</sup> 4
7	2	20 22.2	4.5 -17 06 56	7	2	20 33.0	4.7 + 3 45 19
	10	20 17.7	5.4 -18 02 62		10	20 28.3	5.5 + 4 04 6
	18	20 12.3	5.9 -19 04 63		18	20 22.8	6.1 + 4 10 6
	26	20 06.4	5.9 -20 07 62		26	20 16.7	6.1 + 4 04 20
8	3	20 00.5	5.1 -21 09 57	8	3	20 10.6	5.8 + 3 44 31
	11	19 55.4	-22 06 1		11	20 04.8	+ 3 13 2
518 Halawe				1083 Salvia			
			12 <sup>m</sup> 0				15 <sup>m</sup> 6
7	2	20 23.6	4.3 - 6 07 12	7	10	20 32.0	7.8 -23 53 41
	10	20 19.3	5.6 - 5 55 3		18	20 24.2	8.3 -24 34 39
	18	20 13.7	6.3 - 5 58 18		26	20 15.9	8.3 -25 13 33
	26	20 07.4	6.1 - 6 16 30	8	3	20 07.6	7.8 -25 46 27
8	3	20 01.3	5.4 - 6 46 40		11	19 59.8	6.8 -26 13 18
	11	19 55.9	- 7 26 1		19	19 53.0	-26 31 1
861 Aida				449 Hamburga			
			12 <sup>m</sup> 2				12 <sup>m</sup> 8
7	2	20 24.9	5.1 -19 06 40	7	10	20 31.0	7.0 -21 29 32
	10	20 19.8	5.9 -19 46 43		18	20 24.0	7.6 -22 01 31
	18	20 13.9	6.3 -20 29 42		26	20 16.4	7.6 -22 32 28
	26	20 07.6	6.2 -21 11 42	8	3	20 08.8	7.0 -23 00 23
8	3	20 01.4	5.6 -21 53 36		11	20 01.8	6.2 -23 23 18
	11	19 55.8	-22 29 1		19	19 55.6	-23 41 1
1487 Boda				292 Ludovica			
			14 <sup>m</sup> 4				12 <sup>m</sup> 3
7	2	20 26.8	5.5 -20 20 24	7	10	20 37.3	8.4 -42 44 56
	10	20 21.3	6.2 -20 44 27		18	20 28.9	9.3 -43 40 40
	18	20 15.1	6.5 -21 11 25		26	20 19.6	9.3 -44 20 20
	26	20 08.6	6.4 -21 36 23	8	3	20 10.3	8.5 -44 40 1
8	3	20 02.2	5.8 -21 59 20		11	20 01.8	7.0 -44 41 18
	11	19 56.4	-22 19 1		19	19 54.8	-44 23 1
860 Ursina				1326 Losaka			
			12 <sup>m</sup> 2				14 <sup>m</sup> 5
7	2	20 31.4	7.3 -24 52 11	7	10	20 34.0	6.3 -26 00 89
	10	20 24.1	7.9 -24 41 17		18	20 27.7	7.4 -27 29 88
	18	20 16.2	8.3 -24 24 22		26	20 20.3	7.7 -28 57 81
	26	20 07.9	8.2 -24 02 26	8	3	20 12.6	7.5 -30 18 70
8	3	19 59.7	7.3 -23 36 30		11	20 05.1	6.4 -31 28 58
	11	19 52.4	-23 06 2		19	19 58.7	-32 26 2
5 Astraea				216 Kleopatra			
			10 <sup>m</sup> 8				9 <sup>m</sup> 7
7	2	20 29.3	6.1 -15 37 28	7	10	20 34.8	5.8 + 2 21 10
	10	20 23.2	6.9 -16 05 32		18	20 29.0	6.6 + 2 31 4
	18	20 16.3	7.3 -16 37 33		26	20 22.4	6.8 + 2 27 19
	26	20 09.0	7.1 -17 10 34	8	3	20 15.6	6.7 + 2 08 31
8	3	20 01.9	6.6 -17 44 32		11	20 08.9	5.9 + 1 37 43
	11	19 55.3	-18 16 1		19	20 03.0	+ 0 54 2

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
911 Agamemnon 13 <sup>m</sup> 7				1143 Odysseus 14 <sup>m</sup> 4			
7	10	20 36.2	4.9 -36 19	8	248°		
	18	20 31.3	5.3 -36 27	3	0.722		
	26	20 26.0	5.4 -36 30	2	+7.1		
8	3	20 20.6	5.2 -36 28	7			
	11	20 15.4	4.7 -36 21	13	0.632		
	19	20 10.7	-36 08	2			
439 Ohio 13 <sup>m</sup> 0				1373 1935 QN 16 <sup>m</sup> 0			
7	10	20 36.4	5.2 + 8 05	2	226°		
	18	20 31.2	5.6 + 8 03	16	0.517		
	26	20 25.6	5.8 + 7 47	28	+17		
8	3	20 19.8	5.5 + 7 19	39	7 <sup>m</sup> 2		
	11	20 14.3	5.0 + 6 40	49	0.371		
	19	20 09.3	+ 5 51	1			
624 Hektor 13 <sup>m</sup> 2				1159 Granada 14 <sup>m</sup> 1			
7	10	20 37.8	5.0 -34 28	11	138°		
	18	20 32.8	5.1 -34 39	5	0.717		
	26	20 27.7	5.1 -34 44	2	+6.6		
8	3	20 22.6	5.0 -34 46	4			
	11	20 17.6	4.5 -34 42	10	0.626		
	19	20 13.1	-34 32	2			
72 Feronia 10 <sup>m</sup> 4				1563 Noel 14 <sup>m</sup> 7			
7	10	20 41.0	6.0 - 7 27	7	357°		
	18	20 35.0	7.0 - 7 34	20	0.300		
	26	20 28.0	7.2 - 7 54	31	+78		
8	3	20 20.8	6.8 - 8 25	39	23 <sup>m</sup> 5		
	11	20 14.0	5.5 - 9 04	45	9.995		
	19	20 08.5	- 9 49	1	*		
330 Adalberta 13 <sup>m</sup> 6				549 Jessonda 14 <sup>m</sup> 3			
7	10	20 58.4	12.9 -52 36	22	299°		
	18	20 45.5	14.5 -52 58	9	0.320		
	26	20 31.0	14.3 -52 49	41	+88		
8	3	20 16.7	12.7 -52 08	71	28 <sup>m</sup> 4		
	11	20 04.0	9.9 -50 57	97	0.066		
	19	19 54.1	-49 20	1			
123 Brunhild 12 <sup>m</sup> 1				1256 Normannia 14 <sup>m</sup> 2			
7	10	20 46.6	6.7 -19 21	10	246°		
	18	20 39.9	7.4 -19 31	12	0.457		
	26	20 32.5	7.6 -19 43	9	+49		
8	3	20 24.9	7.4 -19 52	8	9 <sup>m</sup> 7		
	11	20 17.5	6.6 -20 00	4	0.267		
	19	20 10.9	-20 04	1	*		
7	10	20 40.5	3.6 -14 26	12	218°		
	18	20 36.9	4.0 -14 38	13	0.746		
	26	20 32.9	4.0 -14 51	15	+3.6		
8	3	20 28.9	3.9 -15 06	15			
	11	20 25.0	3.7 -15 21	14	0.659		
	19	20 21.3	-15 35	2			
7	10	20 53.0	8.2 - 9 38	63	309°		
	18	20 44.8	9.1 - 8 35	61	0.472		
	26	20 35.7	9.6 - 7 34	56	+116		
8	3	20 26.1	9.5 - 6 38	53	5 <sup>m</sup> 6		
	11	20 16.6	8.9 - 5 45	46	0.297		
	19	20 07.7	- 4 59	7	*		
7	10	20 57.0	8.6 -35 55	12	3°		
	18	20 48.4	9.8 -36 07	1	0.351		
	26	20 38.6	10.1 -36 06	16	+93		
8	3	20 28.5	9.5 -35 50	33	19 <sup>m</sup> 8		
	11	20 19.0	8.0 -35 17	48	0.098		
	19	20 11.0	-34 29	1			
7	10	20 58.2	7.6 -26 57	51	133°		
	18	20 50.6	8.6 -27 48	45	0.367		
	26	20 42.0	9.1 -28 33	37	+2.7		
8	3	20 32.9	8.8 -29 10	25			
	11	20 24.1	7.6 -29 35	12	0.122		
	19	20 16.5	-29 47	13			
7	10	20 58.1	6.1 -15 53	17	242°		
	18	20 52.0	6.8 -16 10	18	0.498		
	26	20 45.2	7.4 -16 28	20	+35		
8	3	20 37.8	7.2 -16 48	20	7 <sup>m</sup> 3		
	11	20 30.6	6.9 -17 08	18	0.330		
	19	20 23.7	-17 26	1			
7	10	20 56.7	4.4 -12 07	11	301°		
	18	20 52.3	5.0 -12 18	15	0.579		
	26	20 47.3	5.2 -12 33	17	-4.6		
8	3	20 42.1	5.2 -12 50	19			
	11	20 36.9	4.9 -13 09	20	0.445		
	19	20 32.0	-13 29	2			

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
738 Alagasta				181 Eucharis			
			13 <sup>m</sup> 6				12 <sup>m</sup> 3
7	10	20 59.4	5.2	7	18	21 02.4	5.3
	18	20 54.2	6.0		26	20 57.1	5.7
	26	20 48.2	6.4	8	3	20 51.4	5.8
8	3	20 41.8	6.2		11	20 45.6	5.5
	11	20 35.6	5.8		19	20 40.1	5.1
	19	20 29.8	-18 54		27	20 35.0	-14 04
			1				1
348 May				659 Nestor			
			13 <sup>m</sup> 2				13 <sup>m</sup> 8
7	10	21 00.6	5.5	7	18	21 01.8	4.2
	18	20 55.1	6.3		26	20 57.6	4.4
	26	20 48.8	6.7	8	3	20 53.2	4.5
8	3	20 42.1	6.7		11	20 48.7	4.3
	11	20 35.4	6.2		19	20 44.4	3.9
	19	20 29.2	-28 13		27	20 40.5	-21 58
			1				2
190 Ismene				432 Pythia			
			12 <sup>m</sup> 7				10 <sup>m</sup> 4
7	10	20 57.7	4.1	7	10	21 07.3	5.5
	18	20 53.6	4.6		18	21 01.8	7.0
	26	20 49.0	4.9		26	20 54.8	7.7
8	3	20 44.1	4.8	8	3	20 47.1	7.6
	11	20 39.3	4.6		11	20 39.5	6.7
	19	20 34.7	-12 56		19	20 32.8	-34 43
			2				1
665 Sabine				787 Moskva			
			12 <sup>m</sup> 2				12 <sup>m</sup> 0
7	10	21 06.7	6.3	7	10	21 05.1	4.1
	18	21 00.4	7.0		18	21 01.0	5.4
	26	20 53.4	7.4		26	20 55.6	6.0
8	3	20 46.0	7.3	8	3	20 49.6	6.0
	11	20 38.7	6.6		11	20 43.6	5.6
	19	20 32.1	-13 27		19	20 38.0	+ 1 47
			1				1
291 Alice				504 Cora			
			14 <sup>m</sup> 1				11 <sup>m</sup> 7
7	18	21 06.1	7.4	7	18	21 06.6	5.4
	26	20 58.7	8.1		26	21 01.2	6.3
	26	20 50.6	8.2	8	3	20 54.9	6.7
8	3	20 42.4	7.6		11	20 48.2	6.1
	11	20 34.8	6.5		19	20 42.1	5.1
	19	20 28.3	-17 46		27	20 37.0	-30 54
			1				2
496 Gryphia				379 Huenna			
			13 <sup>m</sup> 5				11 <sup>m</sup> 7
7	18	21 06.2	7.2	7	18	21 07.4	5.4
	26	20 59.0	8.0		26	21 02.0	6.1
	26	20 51.0	8.1	8	3	20 55.9	6.2
8	3	20 42.9	7.6		11	20 49.7	5.9
	11	20 35.3	6.4		19	20 43.8	5.1
	19	20 28.9	-12 54		27	20 38.7	-16 57
			1				1



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1232 Cortusa				555 Norma			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	08.1	5.9 - 5 04 0	7 18	21	22.1	-15 29 28
26	21	02.2	6.3 - 5 04 7	26	21	16.9	5.2 -15 57 30
8 3	20	55.9	6.4 - 5 11 14	8 3	21	11.2	5.7 -16 27 31
11	20	49.5	6.0 - 5 25 18	11	21	05.3	5.9 -16 58 28
19	20	43.5	5.2 - 5 43 21	19	20	59.4	5.4 -17 26 26
27	20	38.3	- 6 04 1*	27	20	54.0	-17 52 1
			13 <sup>m</sup> 6				14 <sup>m</sup> 6
			66°				195°
			0.482				0.563
			+49'				+20'
			8 <sup>m</sup> 3				5 <sup>m</sup> 8
			0.309				0.423
			1*				1
674 Rachele				319 Leona			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	10.4	6.7 -34 37 46	7 18	21	21.4	4.6 - 2 16 19
26	21	03.7	7.3 -35 23 38	26	21	16.8	5.2 - 2 35 28
8 3	20	56.4	7.4 -36 01 29	8 3	21	11.6	5.6 - 3 03 36
11	20	49.0	7.2 -36 30 17	11	21	06.0	5.5 - 3 39 43
19	20	41.8	6.4 -36 47 7	19	21	00.5	5.2 - 4 22 46
27	20	35.4	-36 54 1*	27	20	55.3	- 5 08 2
			11 <sup>m</sup> 6				13 <sup>m</sup> 9
			223°				298°
			0.529				0.501
			+15'				+3.0
			7 <sup>m</sup> 9				0.338
			0.381				2
			1*				
552 Sigelinde				333 Badenia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	08.8	5.8 - 8 37 5	7 18	21	24.1	5.5 -19 35 22
26	21	03.0	6.3 - 8 42 10	26	21	18.6	6.3 -19 57 22
8 3	20	56.7	6.3 - 8 52 15	8 3	21	12.3	6.7 -20 19 21
11	20	50.4	6.0 - 9 07 18	11	21	05.6	6.6 -20 40 17
19	20	44.4	5.3 - 9 25 18	19	20	59.0	5.9 -20 57 11
27	20	39.1	- 9 43 1*	27	20	53.1	-21 08 1*
			11 <sup>m</sup> 9				12 <sup>m</sup> 2
			59°				316°
			0.481				0.451
			+49'				+52'
			8 <sup>m</sup> 6				10 <sup>m</sup> 9
			0.305				0.259
			1*				1*
1276 Uccia				1237 Genevieve			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	11.5	5.5 -24 14 69	7 18	21	26.5	6.3 -30 40 57
26	21	06.0	6.1 -25 23 67	26	21	20.2	7.3 -31 37 49
8 3	20	59.9	6.3 -26 30 64	8 3	21	12.9	7.9 -32 26 39
11	20	53.6	6.2 -27 34 55	11	21	05.0	7.6 -33 05 24
19	20	47.4	5.5 -28 29 48	19	20	57.4	6.8 -33 29 10
27	20	41.9	-29 17 13	27	20	50.6	-33 39 7*
			14 <sup>m</sup> 4				13 <sup>m</sup> 1
			224°				316°
			0.534				0.395
			+1.6				+55'
			0.383				15 <sup>m</sup> 7
			13				0.173
							7*
1404 Ajax				554 Peraga			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	16.0	4.5 -25 08 8	7 18	21	27.3	6.4 -13 51 18
26	21	11.5	4.8 -25 16 6	26	21	20.9	7.5 -14 09 22
8 3	21	06.7	5.0 -25 22 3	8 3	21	13.4	8.1 -14 31 25
11	21	01.7	4.9 -25 25 1	11	21	05.3	8.0 -14 56 24
19	20	56.8	4.5 -25 26 4	19	20	57.3	7.3 -15 20 22
27	20	52.3	-25 22 2	27	20	50.0	-15 42 1*
			14 <sup>m</sup> 9				10 <sup>m</sup> 9
			293°				271°
			0.698				0.386
			+9.0				+69'
			0.601				13 <sup>m</sup> 6
			2				0.152
							1*
700 Auravictrix				383 Janina			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 18	21	22.0	7.0 -21 36 64	7 18	21	25.3	5.3 -17 37 31
26	21	15.0	8.0 -22 40 61	26	21	20.0	5.9 -18 08 33
8 3	21	07.0	8.4 -23 41 54	8 3	21	14.1	6.3 -18 41 33
11	20	58.6	7.8 -24 35 44	11	21	07.8	6.3 -19 14 30
19	20	50.8	6.7 -25 19 33	19	21	01.5	5.9 -19 44 26
27	20	44.1	-25 52 1	27	20	55.6	-20 10 1
			13 <sup>m</sup> 3				13 <sup>m</sup> 3
			105°				280°
			0.363				0.498
			+41'				+30'
			16 <sup>m</sup> 8				8 <sup>m</sup> 4
			0.113				0.330
			1				1

# OPPOSITION EPHEMERIDES

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
967 Helionape 12 <sup>m</sup> 8				1239 Queteleta 15 <sup>m</sup> 6			
7 18	21 26.6	5.0 -23 16	66 1°	7 18	21 37.1	5.6 -16 23	33 226°
26	21 21.6	6.4 -24 22	65 0.267	26	21 31.5	6.6 -16 56	34 0.499
8 3	21 15.2	7.0 -25 27	55 +90	8 3	21 24.9	7.0 -17 30	34 +4.0
11	21 08.2	6.8 -26 22	42 32 <sup>m</sup> 3	11	21 17.9	7.0 -18 04	32
19	21 01.4	5.5 -27 04	25 9.926	19	21 10.9	6.8 -18 36	29 0.331
27	20 55.9	-27 29	1	27	21 04.1	-19 05	13
754 Malabar 13 <sup>m</sup> 1				1553 1940 AD 15 <sup>m</sup> 2			
7 18	21 26.5	4.7 +10 32	27 201°	7 26	21 33.8	5.9 -16 27	36 186°
26	21 21.8	5.3 +10 05	42 0.495	8 3	21 27.9	6.4 -17 03	37 0.505
8 3	21 16.5	5.7 + 9 23	56 -1	11	21 21.5	6.4 -17 40	34 +28
11	21 10.8	5.6 + 8 27	68 8 <sup>m</sup> 0	19	21 15.1	6.1 -18 14	31 7 <sup>m</sup> 7
19	21 05.2	5.2 + 7 19	79 0.342	27	21 09.0	5.3 -18 45	26 0.340
27	21 00.0	+ 6 00	1	9 4	21 03.7	-19 11	1
199 Byblis 11 <sup>m</sup> 6				704 Interamnia 9 <sup>m</sup> 8			
7 18	21 30.4	5.4 -30 20	74 39°	7 26	21 35.1	6.3 + 2 43	30 322°
26	21 25.0	6.2 -31 34	66 0.440	8 3	21 28.8	7.0 + 3 13	18 0.439
8 3	21 18.8	6.6 -32 40	57 +18	11	21 21.8	7.1 + 3 31	7 +9.3
11	21 12.2	6.4 -33 37	43 13 <sup>m</sup> 4	19	21 14.7	6.9 + 3 38	3
19	21 05.8	5.8 -34 20	29 0.247	27	21 07.8	5.9 + 3 35	14 0.248
27	21 00.0	-34 49	1*	9 4	21 01.9	+ 3 21	2*
1297 Quadea 14 <sup>m</sup> 5				540 Rosamunde 12 <sup>m</sup> 5			
7 18	21 32.0	5.6 -10 51	2 263°	7 26	21 38.9	6.9 - 4 54	34 135°
26	21 26.4	6.3 -10 53	7 0.486	8 3	21 32.0	7.7 - 5 28	43 0.374
8 3	21 20.1	6.7 -11 00	10 +57	11	21 24.3	7.7 - 6 11	50 +56
11	21 13.4	6.7 -11 10	12 8 <sup>m</sup> 0	19	21 16.6	7.2 - 7 01	54 14 <sup>m</sup> 1
19	21 06.7	6.2 -11 22	12 0.314	27	21 09.4	6.0 - 7 55	52 0.134
27	21 00.5	-11 34	1	9 4	21 03.4	- 8 47	1*
208 Lacrimosa 12 <sup>m</sup> 2				1271 Isergina 14 <sup>m</sup> 0			
7 18	21 35.2	5.4 -16 35	27 182°	7 26	21 35.8	5.3 -15 37	43 295°
26	21 29.8	6.3 -17 02	27 0.467	8 3	21 30.5	5.9 -16 20	45 0.480
8 3	21 23.5	6.7 -17 29	29 +45	11	21 24.6	6.0 -17 05	44 +25
11	21 16.8	6.6 -17 58	25 9 <sup>m</sup> 5	19	21 18.6	5.8 -17 49	40 9 <sup>m</sup> 4
19	21 10.2	6.2 -18 23	22 0.285	27	21 12.8	5.0 -18 29	35 0.302
27	21 04.0	-18 45	1*	9 4	21 07.8	-19 04	1
456 Abnoba 12 <sup>m</sup> 7				747 Winchester 10 <sup>m</sup> 3			
7 18	21 35.0	5.4 + 8 36	8 68°	7 26	21 39.6	5.2 -15 58	87 311°
26	21 29.6	6.1 + 8 44	7 0.426	8 3	21 34.4	6.2 -17 25	91 0.417
8 3	21 23.5	6.6 + 8 37	23 +47	11	21 28.2	6.6 -18 56	91 -5
11	21 16.9	6.5 + 8 14	37 10 <sup>m</sup> 9	19	21 21.6	6.4 -20 27	87 12 <sup>m</sup> 9
19	21 10.4	5.9 + 7 37	50 0.238	27	21 15.2	5.8 -21 54	79 0.204
27	21 04.5	+ 6 47	1*	9 4	21 09.4	-23 13	1*

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
490 Veritas				1023 Thomana			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	41.7	4.9 - 4 33	7 26	21	53.4	4.6 - 0 30
8 3	21	36.8	5.4 - 5 06	8 3	21	48.8	5.2 - 0 54
11	21	31.4	5.7 - 5 47	11	21	43.6	5.6 - 1 27
19	21	25.7	5.4 - 6 33	19	21	38.0	5.6 - 2 08
27	21	20.3	4.9 - 7 22	27	21	32.4	5.1 - 2 56
9 4	21	15.4	- 8 11	9 4	21	27.3	- 3 47
			33 307°				24 298°
			41 0.483				33 0.486
			46 +2.9				41 +31
			49 0.309				48 8 <sup>m</sup> 7
			2				51 0.316
							1
866 Fatme				1477 Bonsdorffia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	43.1	5.5 -22 56	7 26	21	57.4	6.2 -13 10
8 3	21	37.6	6.1 -23 46	8 3	21	51.2	6.9 -13 10
11	21	31.5	6.3 -24 32	11	21	44.3	7.4 -13 11
19	21	25.2	6.0 -25 14	19	21	36.9	7.4 -13 14
27	21	19.2	5.2 -25 47	27	21	29.5	7.0 -13 15
9 4	21	14.0	-26 11	9 4	21	22.5	-13 14
			50 330°				0 290°
			46 0.475				1 0.496
			42 +27				3 +10.2
			33 10 <sup>m</sup> 1				1 0.326
			24 0.297*				12
			1				
1030 1924 RQ				782 Montefiore			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	45.8	4.9 + 2 36	7 26	22	01.7	6.6 -20 07
8 3	21	40.9	5.4 + 2 07	8 3	21	55.1	7.8 -21 05
11	21	35.5	5.5 + 1 28	11	21	47.3	8.4 -22 02
19	21	30.0	5.4 + 0 41	19	21	38.9	8.1 -22 53
27	21	24.6	4.9 - 0 11	27	21	30.8	7.1 -23 34
9 4	21	19.7	- 1 08	9 4	21	23.7	-24 02
			29 123°				58 159°
			39 0.526				57 0.354
			47 +14				51 +66
			52 6 <sup>m</sup> 9				41 17 <sup>m</sup> 1
			57 0.376				28 0.098
			1				1
300 Geraldina				1338 Duponta			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	47.2	5.2 -14 32	7 26	22	05.4	6.5 -12 59
8 3	21	42.0	5.9 -14 59	8 3	21	58.9	7.8 -13 17
11	21	36.1	6.1 -15 29	11	21	51.1	8.4 -13 39
19	21	30.0	5.9 -15 58	19	21	42.7	8.5 -14 02
27	21	24.1	5.3 -16 25	27	21	34.2	7.7 -14 23
9 4	21	18.8	-16 48	9 4	21	26.5	-14 40
			27 331°				18 262°
			30 0.492				22 0.368
			29 +41				23 +97
			27 8 <sup>m</sup> 6				21 14 <sup>m</sup> 3
			23 0.321*				17 0.119*
			1				7*
701 Oriola				1194 Aletta			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	49.9	5.3 - 2 37	7 26	22	03.8	5.6 - 3 30
8 3	21	44.6	6.0 - 2 50	8 3	21	58.2	6.4 - 3 30
11	21	38.6	6.1 - 3 11	11	21	51.8	6.6 - 3 37
19	21	32.5	6.0 - 3 38	19	21	45.2	6.7 - 3 50
27	21	26.5	5.4 - 4 10	27	21	38.5	6.2 - 4 08
9 4	21	21.1	- 4 44	9 4	21	32.3	- 4 29
			13 118°				0 147°
			21 0.487				7 0.497
			27 +45				13 +8.1
			32 8 <sup>m</sup> 1				18 0.330
			34 0.317				21 5
			1				
466 Tisiphone				211 Isolda			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
7 26	21	52.0	5.6 + 1 43	7 26	22	00.4	5.1 - 7 22
8 3	21	46.4	6.1 + 1 56	8 3	21	55.3	5.8 - 7 39
11	21	40.3	6.3 + 2 01	11	21	49.5	6.2 - 8 01
19	21	34.0	6.1 + 1 59	19	21	43.3	6.3 - 8 28
27	21	27.9	5.7 + 1 51	27	21	37.0	5.8 - 8 56
9 4	21	22.2	+ 1 37	9 4	21	31.2	- 9 26
			13 132°				17 265°
			5 0.547				22 0.501
			2 +10.4				27 +43
			8 7 <sup>m</sup> 5				28 0.336*
			14 0.404				30 1
			2				

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
122 Gerda				833 Monica			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	22 00.9	4.9	-10 40 28	7 26	22 07.2	5.8	-20 55 18
8 3	21 56.0	5.4	-11 08 30	8 3	22 01.4	6.7	-21 13 17
11 18	21 50.6	5.8	-11 38 33	11 18	21 54.7	7.3	-21 30 13
19 27	21 44.8	5.8	-12 11 33	19 27	21 47.4	7.2	-21 43 7
27 4	21 39.0	5.3	-12 44 30	27 4	21 40.2	6.8	-21 50 1
9 4	21 33.7		-13 14 1	9 4	21 33.4		-21 49 1
			11 <sup>m</sup> 7				13 <sup>m</sup> 5
			147°				309°
			0.529				0.448
			+33'				+73'
			6 <sup>m</sup> 9				10 <sup>m</sup> 2
			0.376*				0.256
			1				1
794 Irenaea				200 Dynamene			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	21 59.8	4.2	- 7 55 40	8 3	22 04.6	6.7	-12 44 15
8 3	21 55.6	5.0	- 8 35 48	11 18	21 57.9	7.3	-12 59 16
11 18	21 50.6	5.6	- 9 23 53	19 27	21 50.6	7.4	-13 15 15
19 27	21 45.0	5.3	-10 16 53	27 4	21 43.2	7.0	-13 30 13
27 4	21 39.7	4.7	-11 09 50	9 4	21 36.2	6.0	-13 43 8
9 4	21 35.0		-11 59 1	12 21	30.2		-13 51 1
			12 <sup>m</sup> 9				11 <sup>m</sup> 1
			21°				291°
			0.365				0.423
			+63'				+77'
			17 <sup>m</sup> 4				10 <sup>m</sup> 9
			0.117				0.214*
			1				1
818 Kapteynia				308 Polyxo			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	22 02.4	5.4	-33 56 61	8 3	22 03.5	5.8	- 7 16 39
8 3	21 57.0	6.4	-34 57 52	11 18	21 57.7	6.3	- 7 55 43
11 18	21 50.6	6.8	-35 49 41	19 27	21 51.4	6.4	- 8 38 47
19 27	21 43.8	6.7	-36 30 28	27 4	21 45.0	5.9	- 9 25 46
27 4	21 37.1	6.1	-36 58 12	9 4	21 39.1	5.0	-10 11 42
9 4	21 31.0		-37 10 1	12 21	34.1		-10 53 2
			12 <sup>m</sup> 8				10 <sup>m</sup> 8
			316°				31°
			0.481				0.426
			+29'				+4.2
			10 <sup>m</sup> 8				0.219
			0.314				2
			1				
1398 Donnera				499 Venusia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	22 02.8	5.4	- 4 26 9	8 3	22 02.5	4.6	- 9 16 22
8 3	21 57.4	6.2	- 4 17 1	11 18	21 57.9	4.9	- 9 38 25
11 18	21 51.2	6.6	- 4 16 4	19 27	21 53.0	5.1	-10 03 26
19 27	21 44.6	6.6	- 4 20 8	27 4	21 47.9	4.8	-10 29 25
27 4	21 38.0	6.1	- 4 28 12	9 4	21 43.1	4.4	-10 54 25
9 4	21 31.9		- 4 40 12	12 21	38.7		-11 19 25
			15 <sup>m</sup> 0				13 <sup>m</sup> 2
			319°				272°
			0.470				0.614
			+8.7				+5.5
			0.289				0.491
			12				2
135 Hertha				883 Matterania			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	22 02.9	4.9	-14 26 15	8 3	22 07.6	6.0	- 5 23 11
8 3	21 58.0	6.2	-14 41 19	11 18	22 01.6	7.0	- 5 12 1
11 18	21 51.8	6.8	-15 00 19	19 27	21 54.6	7.2	- 5 13 8
19 27	21 45.0	6.8	-15 19 16	27 20	21 47.4	6.3	- 5 21 14
27 4	21 38.2	5.8	-15 35 11	9 4	21 41.1	4.8	- 5 35 17
9 4	21 32.4		-15 46 2	12 21	36.3		- 5 52 17
			9 <sup>m</sup> 0				12 <sup>m</sup> 3
			1°				1°
			0.284				0.254
			+5.8				+189
			9.962*				29 <sup>m</sup> 9
			2				9.896
							1
531 Zerlina				684 Hildburg			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,		<sup>h</sup>	<sup>m</sup>	<sup>°</sup> ,
7 26	22 02.8	4.6	+31 26 19	8 3	22 10.6	7.2	-13 55 20
8 3	21 58.2	5.8	+31 07 44	11 18	22 03.4	8.0	-14 15 20
11 18	21 52.4	6.1	+30 23 72	19 27	21 55.4	7.9	-14 35 18
19 27	21 46.3	6.0	+29 11 97	27 20	21 47.5	7.4	-14 53 13
27 4	21 40.3	5.4	+27 34 119	9 4	21 40.1	6.1	-15 06 7
9 4	21 34.9		+25 35 7	12 21	34.0		-15 13 1
			13 <sup>m</sup> 8				13 <sup>m</sup> 4
			55°				55°
			0.412				0.377
			-20'				+92
			12 <sup>m</sup> 8				14 <sup>m</sup> 1
			0.247				0.137
			7				1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.			
1177 Gonnessia				1306 Scythia						
	h	m	°		h	m	°			
8	3	22 07.0	5.2 + 9 53	1	8	3	22 14.3	5.6 + 7 38	11	293°
	11	22 01.8	5.6 + 9 52	12	11	22 08.7	6.2 + 7 49	0	0.485	
	19	21 56.2	5.7 + 9 40	23	19	22 02.5	6.4 + 7 49	12	+63	
	27	21 50.5	5.4 + 9 17	32	27	21 56.1	6.3 + 7 37	20	7 <sup>m</sup> 7	
9	4	21 45.1	4.9 + 8 45	39	9	4	21 49.8	5.6 + 7 17	29	0.320
	12	21 40.2	+ 8 06		12	21 44.2	+ 6 48		1	
1176 Lucidor				964 Subamara						
	h	m	°		h	m	°			
8	3	22 09.8	6.1 - 2 42	11	8	3	22 15.6	6.1 -24 29	35	297°
	11	22 03.7	6.8 - 2 53	20	11	22 09.5	6.7 -25 04	29	0.468	
	19	21 56.9	7.0 - 3 13	26	19	22 02.8	7.0 -25 33	22	+54	
	27	21 49.9	6.8 - 3 39	30	27	21 55.8	6.6 -25 55	12	9 <sup>m</sup> 7	
9	4	21 43.1	5.9 - 4 09	31	9	4	21 49.2	6.0 -26 07	1	0.288
	12	21 37.2	- 4 40		12	21 43.2	-26 08		1	
1205 Ebella				429 Lotis						
	h	m	°		h	m	°			
8	3	22 14.9	6.4 -28 09	32	8	3	22 16.0	5.3 + 5 14	15	316°
	11	22 08.5	7.7 -28 41	21	11	22 10.7	6.1 + 4 59	31	0.380	
	19	22 00.8	8.2 -29 02	3	19	22 04.6	6.4 + 4 28	44	+68	
	27	21 52.6	7.6 -29 05	16	27	21 58.2	6.3 + 3 44	55	14 <sup>m</sup> 3	
9	4	21 45.0	6.2 -28 49	35	9	4	21 51.9	5.5 + 2 49	62	0.151
	12	21 38.8	-28 14		12	21 46.4	+ 1 47		1	
1244 Deira				92 Undina						
	h	m	°		h	m	°			
8	3	22 15.6	7.0 + 0 20	6	8	3	22 20.2	5.0 -20 41	57	0°
	11	22 08.6	7.7 + 0 14	18	11	22 15.2	5.6 -21 38	53	0.471	
	19	22 00.9	7.9 - 0 04	25	19	22 09.6	6.0 -22 31	48	+31	
	27	21 53.0	7.2 - 0 29	30	27	22 03.6	5.7 -23 19	39	10 <sup>m</sup> 2	
9	4	21 45.8	6.8 - 0 59	38	9	4	21 57.9	5.1 -23 58	28	0.292
	12	21 39.0	- 1 37		12	21 52.8	-24 26		1	
740 Cantabia				1028 1923 PG						
	h	m	°		h	m	°			
8	3	22 12.2	5.4 -18 24	52	8	3	22 22.2	5.2 -23 59	41	268°
	11	22 06.8	5.8 -19 16	51	11	22 17.0	5.7 -24 40	38	0.540	
	19	22 01.0	6.0 -20 07	46	19	22 11.3	6.1 -25 18	32	+31	
	27	21 55.0	5.8 -20 53	41	27	22 05.2	5.8 -25 50	24	7 <sup>m</sup> 0	
9	4	21 49.2	5.1 -21 34	33	9	4	21 59.4	5.4 -26 14	15	0.393
	12	21 44.1	-22 07		12	21 54.0	-26 29		1	
1303 Luthera				1265 Schweikarda						
	h	m	°		h	m	°			
8	3	22 14.7	6.3 -37 27	52	8	3	22 25.6	5.7 - 6 46	5	295°
	11	22 08.4	6.7 -38 19	42	11	22 19.9	6.5 - 6 51	10	0.474	
	19	22 01.7	6.9 -39 01	29	19	22 13.4	6.8 - 7 01	13	+71	
	27	21 54.8	6.5 -39 30	16	27	22 06.6	6.6 - 7 14	15	8 <sup>m</sup> 2	
9	4	21 48.3	5.8 -39 46	1	9	4	22 00.0	6.1 - 7 29	14	0.295
	12	21 42.5	-39 47		12	21 53.9	- 7 43		1	

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1390 1935 TA 13 <sup>m</sup> 0				310 Margarita 14 <sup>m</sup> 0			
8	3	22 28.3	6.5 -38 23 33	8	11	22 31.5	6.0 -4 23 33
	11	22 21.8	7.3 -38 56 21		19	22 25.5	6.5 -4 56 38
	19	22 14.5	7.5 -39 17 9		27	22 19.0	6.4 -5 34 39
	27	22 07.0	7.2 -39 26 6	9	4	22 12.6	5.9 -6 13 40
9	4	21 59.8	6.5 -39 20 19		12	22 06.7	5.1 -6 53 36
	12	21 53.3	-39 01		20	22 01.6	-7 29
1559 1942 BF 15 <sup>m</sup> 9				1488 1938 XE 16 <sup>m</sup> 0			
8	3	22 30.2	5.8 -9 33 28	8	11	22 32.5	6.3 -16 28 22
	11	22 24.4	7.4 -10 01 32		19	22 26.2	6.7 -16 50 19
	19	22 17.0	7.7 -10 33 33		27	22 19.5	6.8 -17 09 15
	27	22 09.3	7.6 -11 06 32	9	4	22 12.7	6.4 -17 24 10
9	4	22 01.7	6.5 -11 38 28		12	22 06.3	5.6 -17 34 3
	12	21 55.2	-12 06		20	22 00.7	-17 37
1106 Cydonia 14 <sup>m</sup> 7				921 Jovita 12 <sup>m</sup> 9			
8	3	22 33.5	6.9 -9 47 5	8	11	22 30.3	5.0 +11 38 38
	11	22 26.6	7.7 -9 52 7		19	22 25.3	5.4 +11 00 51
	19	22 18.9	8.1 -9 59 9		27	22 19.9	5.4 +10 09 63
	27	22 10.8	7.8 -10 08 8	9	4	22 14.5	4.9 +9 06 71
9	4	22 03.0	7.2 -10 16 7		12	22 09.6	4.2 +7 55 76
	12	21 55.8	-10 23		20	22 05.4	+6 39
1250 Galanthus 16 <sup>m</sup> 6				2 Pallas 8 <sup>m</sup> 9			
8	3	22 33.0	6.1 +5 34 3	8	11	22 31.6	5.5 +8 48 73
	11	22 26.9	6.9 +5 37 7		19	22 26.1	6.0 +7 35 85
	19	22 20.0	7.3 +5 30 16		27	22 20.1	6.0 +6 10 95
	27	22 12.7	7.3 +5 14 24	9	4	22 14.1	5.8 +4 35 101
9	4	22 05.4	6.9 +4 50 29		12	22 08.3	5.2 +2 54 103
	12	21 58.5	+4 21		20	22 03.1	+1 11
635 Vundtia 12 <sup>m</sup> 5				324 Bambergia 7 <sup>m</sup> 6			
8	3	22 30.0	4.4 +0 05 34	8	11	22 36.0	6.9 -9 42 49
	11	22 25.6	5.0 -0 29 45		19	22 29.1	8.0 -8 53 48
	19	22 20.6	5.4 -1 14 51		27	22 21.1	8.3 -8 05 48
	27	22 15.2	5.5 -2 05 56	9	4	22 12.8	7.7 -7 17 49
9	4	22 09.7	5.1 -3 01 58		12	22 05.1	6.3 -6 28 50
	12	22 04.6	-3 59		20	21 58.8	-5 38
95 Arethusa 10 <sup>m</sup> 8				561 Ingwelde 14 <sup>m</sup> 4			
8	3	22 32.5	4.5 +11 12 7	8	11	22 34.4	5.3 -8 38 33
	11	22 28.0	5.4 +11 19 8		19	22 29.1	5.7 -9 11 35
	19	22 22.6	5.9 +11 11 21		27	22 23.4	5.8 -9 46 36
	27	22 16.7	6.0 +10 50 35	9	4	22 17.6	5.5 -10 22 34
9	4	22 10.7	5.7 +10 15 46		12	22 12.1	5.0 -10 56 31
	12	22 05.0	+9 29		20	22 07.1	-11 27



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
589 Croatia				99 Dike			
12 <sup>m</sup> 6				13 <sup>m</sup> 7			
8	11	22	36.7	4.8	-1	12	46
19	22	31.9	5.3	-1	58	52	303°
27	29	22	26.6	5.5	-2	50	57
9	4	22	21.1	5.1	-3	47	58
12	22	16.0	4.6	-4	45	56	0.315
20	22	11.4	-5	41	56	1	1
961 Gunnie				1233 Kobresia			
13 <sup>m</sup> 2				13 <sup>m</sup> 5			
8	11	22	44.5	7.1	-25	20	29
19	22	37.4	7.9	-25	49	20	16°
27	29	22	29.5	7.9	-26	09	7
9	4	22	21.6	7.3	-26	16	7
12	22	14.3	6.1	-26	09	21	0.168
20	22	08.2	-25	48	21	1	1
677 Aaltje				771 Libera			
13 <sup>m</sup> 2				13 <sup>m</sup> 5			
8	11	22	44.8	5.5	+3	41	13
19	22	39.3	6.1	+3	28	21	148°
27	30	22	33.2	6.3	+3	07	28
9	4	22	26.9	6.1	+2	39	34
12	22	20.8	5.4	+2	05	36	0.321
20	22	15.4	+1	29	36	1	1
440 Theodora				903 Nealley			
13 <sup>m</sup> 4				13 <sup>m</sup> 4			
8	11	22	47.9	6.8	-5	50	34
19	22	41.1	7.7	-6	24	39	236°
27	30	22	33.4	8.0	-7	03	43
9	4	22	25.4	7.8	-7	46	42
12	22	17.6	6.8	-8	28	37	0.132
20	22	10.8	-9	05	37	1	1
1523 1939 BC				1354 1935 GK			
14 <sup>m</sup> 3				13 <sup>m</sup> 2			
8	11	22	50.0	7.2	-6	40	23
19	22	42.8	8.0	-7	03	28	164°
27	30	22	34.8	8.3	-7	31	28
9	4	22	26.5	7.9	-7	59	28
12	22	18.6	6.8	-8	27	24	0.146
20	22	11.8	-8	51	24	1	1
1521 1938 UB <sub>1</sub>				221 Eos			
16 <sup>m</sup> 3				10 <sup>m</sup> 8			
8	11	22	51.1	7.0	-25	03	24
19	22	44.1	7.9	-25	27	17	286°
27	31	22	36.2	8.1	-25	44	6
9	4	22	28.1	7.8	-25	50	5
12	22	20.3	7.0	-25	45	19	0.258
20	22	13.3	-25	26	19	12	12

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
475 Ocllo 10 <sup>m</sup> 5				996 Hilaritas 14 <sup>m</sup> 7			
8	11	23 04.4 6.6 -54 41 0	356°	8	19	23 03.1 5.4 - 6 16 33	217°
	19	22 57.8 8.7 -54 41 45	0.206		27	22 57.7 5.8 - 6 49 34	0.538
	27	22 49.1 9.3 -53 56 93	+209'	9	4	22 51.9 5.9 - 7 23 35	+6.3
9	4	22 39.8 8.0 -52 23 141	59 <sup>m</sup> 3		12	22 46.0 5.5 - 7 58 32	
	12	22 31.8 5.8 -50 02 182	9.856		20	22 40.5 5.0 - 8 30 28	0.388
	20	22 26.0 -47 00	1		28	22 35.5 - 8 58	2
1448 1938 DF 17 <sup>m</sup> 2				759 Vinifera 12 <sup>m</sup> 6			
8	11	23 03.0 6.4 -15 27 45	234°	8	19	23 10.2 8.9 + 8 46 70	19°
	19	22 56.6 7.3 -16 12 45	0.428		27	23 01.3 9.7 + 9 56 55	0.328
	27	22 49.3 7.9 -16 57 40	+6.4	9	4	22 51.6 9.7 +10 51 37	+198'
9	4	22 41.4 7.9 -17 37 34			12	22 41.9 9.0 +11 28 22	15 <sup>m</sup> 8
	12	22 33.5 7.2 -18 11 23	0.226		20	22 32.9 7.5 +11 50 9	0.059
	20	22 26.3 -18 34	12		28	22 25.4 +11 59	1
1192 Prisma 14 <sup>m</sup> 9				1218 Aster 15 <sup>m</sup> 6			
8	11	23 11.1 8.5 -25 30 24	214°	8	19	23 07.4 7.1 -11 19 48	215°
	19	23 02.6 9.4 -25 54 17	0.465		27	23 00.3 7.7 -12 07 48	0.394
	27	22 53.2 9.9 -26 11 5	+12.8	9	4	22 52.6 7.9 -12 55 43	+72'
9	4	22 43.3 9.8 -26 16 6			12	22 44.7 7.4 -13 38 36	12 <sup>m</sup> 2
	12	22 33.5 9.1 -26 10 20	0.288		20	22 37.3 6.2 -14 14 25	0.167
	20	22 24.4 -25 50	5		28	22 31.1 -14 39	1
1277 Dolores 13 <sup>m</sup> 1				1347 Patria 13 <sup>m</sup> 5			
8	11	23 01.4 5.0 + 6 58 9	31°	8	19	23 04.8 5.7 +12 41 26	274°
	19	22 56.4 5.9 + 6 49 25	0.341		27	22 59.1 6.4 +12 15 41	0.411
	27	22 50.5 6.5 + 6 24 39	+101'	9	4	22 52.7 6.5 +11 34 56	+58'
9	4	22 44.0 6.2 + 5 45 50	17 <sup>m</sup> 7		12	22 46.2 6.2 +10 38 65	11 <sup>m</sup> 8
	12	22 37.8 5.4 + 4 55 55	0.083		20	22 40.0 5.2 + 9 33 72	0.204*
	20	22 32.4 + 4 00	1		28	22 34.8 + 8 21	1
727 Nipponia 12 <sup>m</sup> 5				1197 Rhodesia 13 <sup>m</sup> 9			
8	11	23 02.3 4.5 -14 41 95	303°	8	19	23 06.2 5.6 +13 05 17	175°
	19	22 57.8 5.6 -16 16 96	0.389		27	23 00.6 6.0 +12 48 26	0.551
	27	22 52.2 6.2 -17 52 91	+29'	9	4	22 54.6 6.0 +12 22 37	+33'
9	4	22 46.0 6.2 -19 23 83	14 <sup>m</sup> 9		12	22 48.6 5.9 +11 45 43	5 <sup>m</sup> 3
	12	22 39.8 5.8 -20 46 69	0.161*		20	22 42.7 5.2 +11 02 48	0.414
	20	22 34.0 -21 55	1		28	22 37.5 +10 14	1
622 Esther 11 <sup>m</sup> 6				630 Euphemia 14 <sup>m</sup> 0			
8	19	23 01.2 4.8 - 9 49 90	324°	8	19	23 08.5 6.1 -22 46 69	199°
	27	22 56.4 5.8 -11 19 94	0.303		27	23 02.4 6.7 -23 55 61	0.464
9	4	22 50.6 6.2 -12 53 90	+73'	9	4	22 55.7 6.8 -24 56 50	+30'
	12	22 44.4 5.6 -14 23 81	23 <sup>m</sup> 2		12	22 48.9 6.5 -25 46 37	9 <sup>m</sup> 7
	20	22 38.8 4.4 -15 44 65	0.001*		20	22 42.4 5.5 -26 23 22	0.286
	28	22 34.4 -16 49	1		28	22 36.9 -26 45	1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
1238 Predappia 15 <sup>m</sup> 0				86 Semele 11 <sup>m</sup> 4					
8	19	23 12.2 6.7	-24 12 44	198°	8	19	23 24.4 4.7	-11 38 45	328°
	27	23 05.5 7.3	-24 56 36	0.483		27	23 19.7 5.6	-12 23 45	0.418
9	4	22 58.2 7.4	-25 32 26	+49'	9	4	23 14.1 6.0	-13 08 42	+69'
	12	22 50.8 7.0	-25 58 12	8 <sup>m</sup> 0		12	23 08.1 6.0	-13 50 36	12 <sup>m</sup> 3
	20	22 43.8 6.2	-26 10 0	0.316		20	23 02.1 5.3	-14 26 26	0.209*
	28	22 37.6	-26 10	1		28	22 56.8	-14 52	1
1362 Griqua 12 <sup>m</sup> 6				1384 Kniertje 13 <sup>m</sup> 9					
8	19	23 09.9 3.8	-28 52 132	338°	8	19	23 25.4 4.6	-6 10 75	299°
	27	23 06.1 4.7	-31 04 120	0.371		27	23 20.8 5.5	-7 25 80	0.403
9	4	23 01.4 5.2	-33 04 102	-2'	9	4	23 15.3 6.0	-8 45 82	+37'
	12	22 56.2 4.9	-34 46 78	19 <sup>m</sup> 4		12	23 09.3 6.1	-10 07 79	13 <sup>m</sup> 1
	20	22 51.3 4.0	-36 04 52	0.146*		20	23 03.2 5.4	-11 26 71	0.184
	28	22 47.3	-36 56	1		28	22 57.8	-12 37	1
1024 Hale 14 <sup>m</sup> 2				337 Devosa 11 <sup>m</sup> 5					
8	19	23 22.1 6.2	-34 23 51	343°	8	19	23 34.6 6.5	-6 23 18	269°
	27	23 15.9 7.2	-35 14 32	0.358		27	23 28.1 7.5	-6 41 22	0.388
9	4	23 08.7 7.6	-35 46 11	+95'	9	4	23 20.6 8.3	-7 03 22	+105'
	12	23 01.1 7.2	-35 57 13	18 <sup>m</sup> 9		12	23 12.3 8.3	-7 25 21	11 <sup>m</sup> 9
	20	22 53.9 6.0	-35 44 37	0.129		20	23 04.0 7.6	-7 46 14	0.159*
	28	22 47.9	-35 07	1		28	22 56.4	-8 00	1
906 Repsolda 11 <sup>m</sup> 6				558 Carmen 12 <sup>m</sup> 3					
8	19	23 24.2 6.3	-22 18 35	5°	8	19	23 30.8 4.6	-7 16 54	255°
	27	23 17.9 7.0	-22 53 27	0.424		27	23 26.2 5.4	-8 10 58	0.470
9	4	23 10.9 7.3	-23 20 17	+83'	9	4	23 20.8 5.8	-9 08 58	+4.2
	12	23 03.6 7.0	-23 37 3	11 <sup>m</sup> 5		12	23 15.0 5.9	-10 06 54	
	20	22 56.6 6.2	-23 40 11	0.224*		20	23 09.1 5.3	-11 00 48	0.289
	28	22 50.4	-23 29	1		28	23 03.8	-11 48	2
1213 Algeria 14 <sup>m</sup> 0				1356 Nyanza 12 <sup>m</sup> 6					
8	19	23 22.1 5.1	+16 04 9	340°	8	19	23 32.4 5.0	-15 58 43	343°
	27	23 17.0 5.8	+16 13 5	0.443		27	23 27.4 5.9	-16 41 42	0.470
9	4	23 11.2 6.2	+16 08 19	+72'	9	4	23 21.5 6.2	-17 23 36	+57'
	12	23 05.0 6.2	+15 49 32	10 <sup>m</sup> 4		12	23 15.3 6.1	-17 59 28	9 <sup>m</sup> 2
	20	22 58.8 5.6	+15 17 43	0.256*		20	23 09.2 5.7	-18 27 17	0.293
	28	22 53.2	+14 34	7		28	23 03.5	-18 44	1
106 Dione 10 <sup>m</sup> 7				661 Cloelia 12 <sup>m</sup> 9					
8	19	23 22.4 5.0	-11 37 38	321°	8	27	23 31.8 6.0	-0 23 17	195°
	27	23 17.4 5.7	-12 15 38	0.450	9	4	23 25.8 6.6	-0 40 19	0.496
9	4	23 11.7 6.1	-12 53 35	+64'		12	23 19.2 6.5	-0 59 22	+65'
	12	23 05.6 6.0	-13 28 30	10 <sup>m</sup> 2		20	23 12.7 6.1	-1 21 21	6 <sup>m</sup> 9
	20	22 59.6 5.4	-13 58 21	0.259*		28	23 06.6 5.5	-1 42 19	0.328
	28	22 54.2	-14 19	1	10	6	23 01.1	-2 01	1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
944 Hidalgo				85 Io			
	h	m	°		h	m	°
8 27	23	37.0	8.5 -51 59	20	324°		
9 4	23	28.5	8.9 -52 19	6	0.666		
12 12	23	19.6	9.1 -52 25	8	+30'		
20 12	23	10.5	8.7 -52 17	24	3 <sup>m</sup> 0		
28	23	01.8	7.8 -51 53	37	0.590		
10 6	22	54.0	-51 16	1			
976 Benjamina				1032 Pafuri			
	h	m	°		h	m	°
8 19	23	31.0	4.6 + 7 43	20	159°		
27	23	26.4	5.2 + 7 23	29	0.552		
9 4	23	21.2	5.6 + 6 54	35	+32'		
12 12	23	15.6	5.5 + 6 19	40	5 <sup>m</sup> 6		
20	23	10.1	5.2 + 5 39	43	0.411		
28	23	04.9	+ 4 56	7	*		
943 Begonia				851 Zeissia			
	h	m	°		h	m	°
8 27	23	32.0	5.4 -16 49	54	251°		
9 4	23	26.6	5.7 -17 43	51	0.537		
12 13	23	20.9	5.8 -18 34	44	+23'		
20 13	23	15.1	5.5 -19 18	35	6 <sup>m</sup> 5		
28	23	09.6	5.0 -19 53	25	0.391		
10 6	23	04.6	-20 18	1			
823 Sisigambis				972 Cohnia			
	h	m	°		h	m	°
8 27	23	36.3	6.7 + 4 11	34	248°		
9 4	23	29.6	7.6 + 3 37	45	0.364		
12 13	23	22.0	7.7 + 2 52	52	+90'		
20 13	23	14.3	7.3 + 2 00	54	14 <sup>m</sup> 1		
28	23	07.0	6.1 + 1 06	52	0.118		
10 6	23	00.9	+ 0 14	1			
591 Irmgard				764 Gedania			
	h	m	°		h	m	°
8 27	23	36.1	6.8 + 2 01	15	151°		
9 4	23	29.3	7.2 + 1 46	20	0.503		
12 13	23	22.1	7.2 + 1 26	22	+62'		
20 13	23	14.9	6.8 + 1 04	24	5 <sup>m</sup> 9		
28	23	08.1	6.1 + 0 40	23	0.339		
10 6	23	02.0	+ 0 17	1			
442 Eichsfeldia				400 Ducrosa			
	h	m	°		h	m	°
8 27	23	37.2	6.4 - 7 46	66	124°		
9 4	23	30.8	7.0 - 8 52	66	0.389		
12 13	23	23.8	7.0 - 9 58	60	+61'		
20 13	23	16.8	6.5 -10 58	51	13 <sup>m</sup> 2		
28	23	10.3	5.4 -11 49	40	0.159		
10 6	23	04.9	-12 29	1	*		
8 27	23	34.6	4.6 +11 26	63	19°		
9 4	23	30.0	5.2 +10 23	79	0.339		
12 14	23	24.8	5.4 + 9 04	91	+67'		
20 14	23	19.4	4.8 + 7 33	97	18 <sup>m</sup> 9		
28	23	14.6	3.7 + 5 56	97	0.076		
10 6	23	10.9	+ 4 19	1	*		
8 27	23	37.2	5.7 -17 49	45	69°		
9 4	23	31.5	6.2 -18 34	37	0.481		
12 14	23	25.3	6.2 -19 11	30	+51'		
20 14	23	19.1	5.7 -19 41	18	8 <sup>m</sup> 7		
28	23	13.4	5.0 -19 59	6	0.310		
10 6	23	08.4	-20 05	1			
8 27	23	46.9	6.4 - 3 16	52	209°		
9 4	23	40.5	7.3 - 4 08	56	0.382		
12 15	23	33.2	7.7 - 5 04	57	+74'		
20 15	23	25.5	7.2 - 6 01	52	12 <sup>m</sup> 9		
28	23	18.3	6.4 - 6 53	44	0.148		
10 6	23	11.9	- 7 37	1			
8 27	23	45.9	4.9 +12 08	4	349°		
9 4	23	41.0	5.9 +12 12	10	0.381		
12 16	23	35.1	6.2 +12 02	22	+107'		
20 16	23	28.9	6.1 +11 40	33	14 <sup>m</sup> 4		
28	23	22.8	5.2 +11 07	39	0.154		
10 6	23	17.6	+10 28	1			
8 27	23	45.8	5.0 +14 07	13	302°		
9 4	23	40.8	5.6 +13 54	25	0.483		
12 16	23	35.2	5.8 +13 29	34	+54'		
20 16	23	29.4	5.8 +12 55	45	8 <sup>m</sup> 5		
28	23	23.6	5.2 +12 10	48	0.315		
10 6	23	18.4	+11 22	1			
8 27	23	46.9	5.5 + 4 49	12	148°		
9 4	23	41.4	6.1 + 4 37	18	0.537		
12 16	23	35.3	6.3 + 4 19	23	+9.6		
20 16	23	29.0	6.0 + 3 56	25			
28	23	23.0	5.6 + 3 31	24	0.389		
10 6	23	17.4	+ 3 07	2	*		

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
602 Marianna				1508 1938 UO			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	51.3	6.4 + 7 01 35	9 4	0	08.6	9.3 - 21 17 17
9 4	23	44.9	7.3 + 7 36 26	12	23	59.3	10.0 - 21 34 5
12	23	37.6	7.9 + 8 02 17	20	23	49.3	10.3 - 21 39 8
20	23	29.7	7.7 + 8 19 9	28	23	39.0	9.9 - 21 31 23
28	23	22.0	6.8 + 8 28 4	10 6	23	29.1	9.0 - 21 08 38
10 6	23	15.2	+ 8 32 1	14	23	20.1	- 20 30 12
79 Eurynome				489 Comacina			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	48.6	4.8 + 4 34 40	9 4	0	01.2	4.8 - 1 58 60
9 4	23	43.8	5.9 + 3 54 53	12	23	56.4	5.2 - 2 58 61
12	23	37.9	6.5 + 3 01 62	20	23	51.2	5.3 - 3 59 59
20	23	31.4	6.3 + 1 59 66	28	23	45.9	4.9 - 4 58 55
28	23	25.1	5.5 + 0 53 64	10 6	23	41.0	4.4 - 5 53 50
10 6	23	19.6	- 0 11 1	14	23	36.6	- 6 43 1
792 Metcalfia				783 Nora			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	50.9	5.6 + 12 52 15	9 4	0	05.0	5.6 - 8 40 97
9 4	23	45.3	6.5 + 12 37 28	12	23	59.4	6.2 - 10 17 90
12	23	38.8	6.8 + 12 09 40	20	23	53.2	6.2 - 11 47 76
20	23	32.0	6.7 + 11 29 46	28	23	47.0	5.3 - 13 03 56
28	23	25.3	6.2 + 10 43 53	10 6	23	41.7	3.9 - 13 59 35
10 6	23	19.1	+ 9 50 1	14	23	37.8	- 14 34 1
532 Herculina				587 Hypsipyle			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	54.9	5.5 - 21 52 66	9 4	0	14.3	8.9 + 27 19 46
9 4	23	49.4	6.3 - 22 58 58	12	0	05.4	9.9 + 28 05 27
12	23	43.1	6.4 - 23 56 47	20	23	55.5	10.5 + 28 32 8
20	23	36.7	6.3 - 24 43 35	28	23	45.0	10.2 + 28 40 12
28	23	30.4	5.7 - 25 18 21	10 6	23	34.8	9.4 + 28 28 28
10 6	23	24.7	- 25 39 2	14	23	25.4	+ 28 00 1
314 Rosalia				1425 1937 GB			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	50.8	3.9 - 0 08 69	9 4	0	08.8	5.4 + 4 48 65
9 4	23	46.9	4.7 - 1 17 76	12	0	03.4	6.0 + 3 43 71
12	23	42.2	5.0 - 2 33 79	20	23	57.4	6.1 + 2 32 75
20	23	37.2	4.8 - 3 52 76	28	23	51.3	5.8 + 1 17 73
28	23	32.4	4.4 - 5 08 69	10 6	23	45.5	5.1 + 0 04 69
10 6	23	28.0	- 6 17 1	14	23	40.4	- 1 05 12
515 Athalia				605 Juvisia			
	<sup>h</sup>	<sup>m</sup>	<sup>s</sup>		<sup>h</sup>	<sup>m</sup>	<sup>s</sup>
8 27	23	57.1	4.6 - 2 44 37	9 4	0	13.6	7.4 + 9 47 32
9 4	23	52.5	5.4 - 3 21 41	12	0	06.2	8.2 + 10 19 21
12	23	47.1	5.9 - 4 02 43	20	23	58.0	8.5 + 10 40 14
20	23	41.2	5.8 - 4 45 41	28	23	49.5	8.1 + 10 54 7
28	23	35.4	5.4 - 5 26 36	10 6	23	41.4	7.2 + 11 01 1
10 6	23	30.0	- 6 02 1	14	23	34.2	+ 11 02 1

1947	$\alpha_{1950}$		$\delta_{1950}$		Misc.		1947	$\alpha_{1950}$		$\delta_{1950}$		Misc.		
632 Pyrrha							1323 Tugela							
		h	m	°	'			h	m	°	'			
9	4	0	11.4	6.4	+ 0 59 35	14 <sup>m</sup> 7	9	4	0	17.9	5.9	-20 54 32	176°	
	12	0	05.0	6.9	+ 0 24 39	92°		12	0	12.0	6.3	-21 26 24	0.579	
	20	23	58.1	7.0	- 0 15 38	0.442		20	24	0	05.7	6.4	-21 50 16	+44
	28	23	51.1	6.5	- 0 53 36	+68		28	24	23	59.3	6.2	-22 06 6	4 <sup>m</sup> 5
10	6	23	44.6	5.6	- 1 29 31	9 <sup>m</sup> 3	10	6	23	53.1	5.7	-22 12 5	0.453	
	14	23	39.0		- 2 00 1	0.247		14	23	47.4		-22 07 1	1	
191 Kolga							966 Muschi							
		h	m	°	'			h	m	°	'			
9	4	0	10.2	4.7	- 3 21 72	11 <sup>m</sup> 5	9	4	0	21.1	6.5	-21 52 48	91°	
	12	0	05.5	5.4	- 4 33 75	338°		12	0	14.6	7.3	-22 40 36	0.442	
	20	23	00.1	5.6	- 5 48 72	0.426		20	25	0	07.3	7.3	-23 16 21	+70
	28	23	54.5	5.3	- 7 00 65	+3.3		28	25	0	00.0	6.9	-23 37 6	10 <sup>m</sup> 0
10	6	23	49.2	4.6	- 8 05 55	0.222	10	6	23	53.1	6.1	-23 43 11	0.257	
	14	23	44.6		- 9 00 2	2*		14	23	47.0		-23 32 1	1	
262 Valda							742 Edisona							
		h	m	°	'			h	m	°	'			
9	4	0	16.0	6.4	- 9 13 31	13 <sup>m</sup> 3	9	4	0	19.9	5.7	-16 19 39	7°	
	12	0	09.6	7.4	- 9 44 27	316°		12	0	14.2	6.5	-16 58 32	0.428	
	20	23	02.2	7.8	-10 11 21	0.350		20	25	0	07.7	6.7	-17 30 21	+81
	28	23	54.4	7.6	-10 32 9	+122		28	25	0	01.0	6.3	-17 51 8	11 <sup>m</sup> 0
10	6	23	46.8	6.6	-10 41 3	15 <sup>m</sup> 6	10	6	23	54.7	5.6	-17 59 6	0.231	
	14	23	40.2		-10 38 1	0.094		14	23	49.1		-17 53 1	1*	
645 Agrippina							1181 Lilith							
		h	m	°	'			h	m	°	'			
9	4	0	14.0	5.5	+ 0 35 19	13 <sup>m</sup> 3	9	4	0	21.5	4.9	+12 25 16	325°	
	12	0	08.5	6.1	+ 0 16 23	291°		12	0	16.6	6.0	+12 09 29	0.358	
	20	24	02.4	6.4	- 0 07 24	0.490		20	25	0	10.6	6.6	+11 40 42	+5.9
	28	24	23 56.0	6.2	- 0 31 23	+66		28	25	0	04.0	6.5	+10 58 50	7 <sup>m</sup> 4
10	6	23	49.8	5.7	- 0 54 20	7 <sup>m</sup> 4	10	6	23	57.5	5.8	+10 08 55	0.111	
	14	23	44.1		- 1 14 1	0.320		14	23	51.7		+ 9 13 5	1	
196 Philomela							1200 Imperatrix							
		h	m	°	'			h	m	°	'			
9	4	0	14.6	5.4	- 9 46 39	10 <sup>m</sup> 4	9	4	0	22.8	4.9	+ 5 43 38	100°	
	12	0	09.2	6.0	-10 25 37	88°		12	0	17.9	5.6	+ 5 05 43	0.498	
	20	24	03.2	6.0	-11 02 32	0.493		20	26	0	12.3	5.8	+ 4 22 47	+40
	28	24	23 57.2	5.8	-11 34 24	+54		28	26	0	06.5	5.6	+ 3 35 48	7 <sup>m</sup> 6
10	6	23	51.4	5.2	-11 58 15	7 <sup>m</sup> 8	10	6	0	00.9	5.1	+ 2 47 45	0.333	
	14	23	46.2		-12 13 1	0.326		14	23	55.8		+ 2 02 1	1	
1357 1935 ND							187 Lamberta							
		h	m	°	'			h	m	°	'			
9	4	0	15.3	5.4	-21 48 51	12 <sup>m</sup> 5	9	12	0	28.7	6.8	- 3 21 26	129°	
	12	0	09.9	6.0	-22 39 40	346°		20	0	21.9	7.1	- 3 47 26	0.508	
	20	24	03.9	6.2	-23 19 27	0.445		28	28	0	14.8	7.1	- 4 13 22	+9.6
	28	24	23 57.7	5.9	-23 46 10	+62		10	6	0	07.7	6.4	- 4 35 18	10 <sup>m</sup> 9
10	6	23	51.8	5.2	-23 56 5	10 <sup>m</sup> 9	10	6	0	01.3	5.7	- 4 53 10	0.350	
	14	23	46.6		-23 51 1	0.262		14	23	55.6		- 5 03 2	2*	



## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
611 Valeria				1489 1939 GC			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	27.5	+ 6 16	9 12	0	34.9	+ 2 08
20	0	22.5	+ 5 10	20	0	29.8	+ 1 30
28	0	17.1	+ 3 58	28	0	24.3	+ 0 51
10 6	0	11.6	+ 2 44	10 6	0	18.8	+ 0 12
14	0	06.4	+ 1 32	14	0	13.5	- 0 24
22	0	02.0	+ 0 25	22	0	08.7	- 0 56
			12 <sup>m</sup> 1				16 <sup>m</sup> 1
			294°				207°
			0.459				0.564
			+25'				+31'
			9 <sup>m</sup> 8				5 <sup>m</sup> 2
			0.273				0.426
			1*				1
231 Vindobona				1175 Margo			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	32.2	+ 4 56	9 12	0	35.2	+23 10
20	0	26.0	+ 4 30	20	0	30.2	+22 37
28	0	19.3	+ 4 01	28	0	24.8	+21 51
10 6	0	12.8	+ 3 30	10 6	0	19.2	+20 54
14	0	06.6	+ 3 01	14	0	13.9	+19 48
22	0	01.4	+ 2 35	22	0	09.3	+18 37
			12 <sup>m</sup> 5				14 <sup>m</sup> 2
			92°				49°
			0.478				0.500
			+62'				+28'
			7 <sup>m</sup> 8				8 <sup>m</sup> 5
			0.302				0.343
			1*				1
563 Suleika				1152 Pawona			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	33.4	-15 44	9 12	0	40.5	+ 8 56
20	0	27.4	-16 38	20	0	33.7	+ 8 35
28	0	20.6	-17 23	28	0	26.2	+ 8 05
10 6	0	13.6	-17 52	10 6	0	18.5	+ 7 30
14	0	07.2	-18 03	14	0	11.2	+ 6 53
22	0	01.8	-17 54	22	0	04.9	+ 6 18
			10 <sup>m</sup> 2				13 <sup>m</sup> 6
			322°				180°
			0.359				0.403
			+90'				+7.8
			15 <sup>m</sup> 7				0.185
			0.119				5
			1*				
760 Massinga				843 Nicolaia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	32.5	+13 38	9 12	0	44.7	+ 3 11
20	0	27.1	+13 29	20	0	36.8	+ 3 22
28	0	21.0	+13 10	28	0	28.0	+ 3 27
10 6	0	14.8	+12 46	10 6	0	19.2	+ 3 30
14	0	08.8	+12 17	14	0	11.3	+ 3 34
22	0	03.3	+11 47	22	0	05.0	+ 3 41
			12 <sup>m</sup> 8				13 <sup>m</sup> 6
			216°				31°
			0.578				0.280
			+45'				+209'
			4 <sup>m</sup> 4				22 <sup>m</sup> 8
			0.446				9.955
			1*				1
1358 1935 OB				101 Helena			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	37.2	+ 2 25	9 12	0	43.3	+10 42
20	0	30.6	+ 1 53	20	0	36.2	+10 51
28	0	23.3	+ 1 16	28	0	28.2	+10 50
10 6	0	16.0	+ 0 41	10 6	0	20.0	+10 41
14	0	09.5	+ 0 11	14	0	12.3	+10 26
22	0	04.2	- 0 11	22	0	05.8	+10 10
			13 <sup>m</sup> 3				10 <sup>m</sup> 0
			41°				31°
			0.342				0.360
			+7.2				+137'
			0.077				14 <sup>m</sup> 4
			5				0.113
							1*
150 Nuwa				1242 Zambesia			
	<sup>h</sup>	<sup>m</sup>	<sup>°</sup>		<sup>h</sup>	<sup>m</sup>	<sup>°</sup>
9 12	0	33.9	+ 5 15	9 12	0	43.2	+ 8 40
20	0	28.6	+ 4 36	20	0	36.7	+ 8 52
			10 <sup>m</sup> 8				11 <sup>m</sup> 3
			7°				338°
			0.110				

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1199 Geldonia 13 <sup>m</sup> 6				287 Nephthys 10 <sup>m</sup> 8			
9	12	h m		9	12	h m	
	20	0 40.9 5.2	+14 49 34		20	0 53.1 5.6	- 5 50 80
	28	0 35.7 5.7	+14 15 44		28	0 47.5 6.5	- 7 10 79
10	6	0 30.0 5.8	+13 31 50	10	6	0 41.0 6.8	- 8 29 69
	14	0 24.2 5.7	+12 41 55		14	0 34.2 6.6	- 9 38 57
	22	0 18.5 5.0	+11 46 56		22	0 27.6 5.8	-10 35 42
		0 13.5	+10 50			0 21.8	-11 17
			216°				102°
			0.492,				0.374,
			+4.7				+62,
			0.326				14 <sup>m</sup> 4
			13				0.138*
							1
1491 1938 EI 14 <sup>m</sup> 9				206 Hersilia 11 <sup>m</sup> 9			
9	12	h m		9	12	h m	
	20	0 42.3 5.3	+ 9 01 23		20	0 54.6 5.2	+ 1 58 47
	28	0 37.0 5.8	+ 8 38 30		28	0 49.4 6.0	+ 1 11 49
10	6	0 31.2 6.0	+ 8 08 33	10	6	0 43.4 6.3	+ 0 22 50
	14	0 25.2 6.0	+ 7 35 35		14	0 37.1 6.3	- 0 28 46
	22	0 19.2 5.4	+ 7 00 35		22	0 30.8 5.6	- 1 14 39
		0 13.8	+ 6 25			0 25.2	- 1 53
			278°				289°
			0.508,				0.433,
			+50,				+58,
			7 <sup>m</sup> 1				10 <sup>m</sup> 5
			0.347				0.234*
			1				1
189 Phthia 11 <sup>m</sup> 3				663 Gerlinde 13 <sup>m</sup> 8			
9	12	h m		9	12	h m	
	20	0 44.5 5.6	+ 8 10 52		20	0 54.1 4.8	+23 08 30
	28	0 38.9 6.4	+ 7 18 60		28	0 49.3 5.5	+22 38 42
10	6	0 32.5 6.7	+ 6 18 65	10	6	0 43.8 5.7	+21 56 51
	14	0 25.8 6.4	+ 5 13 65		14	0 38.1 5.7	+21 05 60
	22	0 19.4 5.4	+ 4 08 59		22	0 32.4 5.3	+20 05 66
		0 14.0	+ 3 09			0 27.1	+18 59
			358°				194°
			0.373,				0.548,
			+72,				+16,
			14 <sup>m</sup> 6				6 <sup>m</sup> 4
			0.134*				0.412
			1				1
761 Brendelia 13 <sup>m</sup> 5				137 Meliboea 11 <sup>m</sup> 1			
9	12	h m		9	12	h m	
	20	0 46.8 5.6	+ 3 43 30		20	0 53.8 4.5	+12 21 61
	28	0 41.2 6.3	+ 3 13 35		28	0 49.3 5.2	+11 20 71
10	6	0 34.9 6.5	+ 2 38 35	10	6	0 44.1 5.4	+10 09 77
	14	0 28.4 6.3	+ 2 03 33		14	0 38.7 5.3	+ 8 52 78
	22	0 22.1 5.5	+ 1 30 28		22	0 33.4 4.6	+ 7 34 75
		0 16.6	+ 1 02			0 28.8	+ 6 19
			44°				43°
			0.437,				0.434,
			+71,				+30,
			11 <sup>m</sup> 0				11 <sup>m</sup> 6
			0.240				0.237*
			7				1
1471 1938 SL <sub>1</sub> 14 <sup>m</sup> 8				573 Recha 12 <sup>m</sup> 5			
9	12	h m		9	12	h m	
	20	0 50.3 6.5	+22 08 27		20	0 58.6 5.6	+12 56 4
	28	0 43.8 7.6	+22 35 11		28	0 53.0 6.6	+13 00 4
10	6	0 36.2 8.1	+22 46 5	10	6	0 46.4 7.0	+12 56 13
	14	0 28.1 7.9	+22 41 19		14	0 39.4 7.0	+12 43 18
	22	0 20.2 7.2	+22 22 30		22	0 32.4 6.5	+12 25 21
		0 13.0	+21 52			0 25.9	+12 04
			328°				0°
			0.391,				0.430,
			+8.8				+94,
			0.175				10 <sup>m</sup> 4
			12				0.233
							1
354 Eleonora 10 <sup>m</sup> 5				541 Deborah 13 <sup>m</sup> 0			
9	12	h m		9	12	h m	
	20	0 48.8 5.0	-13 41 79		20	0 58.1 5.3	+15 34 22
	28	0 43.8 5.8	-15 00 73		28	0 52.8 6.1	+15 12 33
10	6	0 38.0 6.0	-16 13 63	10	6	0 46.7 6.5	+14 39 42
	14	0 32.0 5.9	-17 16 50		14	0 40.2 6.4	+13 57 46
	22	0 26.1 5.3	-18 06 35		22	0 33.8 5.9	+13 11 48
		0 20.8	-18 41			0 27.9	+12 23
			228°				103°
			0.483,				0.455,
			+20,				+5.6
			8 <sup>m</sup> 5				0.270
			0.317*				2
			1				

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
158 Koronis 12 <sup>m</sup> 1				1329 Eliane 12 <sup>m</sup> 5			
9 12	h 1 00.4	m 5.0	+ 8 04 28 313°	9 20	h 1 02.7	m 6.0	-14 08 80 55°
20	0 55.4	5.9	+ 7 36 36 0.442,	28	0 56.7	6.5	-15 28 65 0.383,
28	0 49.5	6.3	+ 7 00 40 +6.3	10 6	0 50.2	6.4	-16 33 48 +4.2
10 6	0 43.2	6.4	+ 6 20 40	14	0 43.8	5.7	-17 21 28
14	0 36.8	5.9	+ 5 40 40 0.248*	22	0 38.1	4.4	-17 49 6 0.163
22	0 30.9		+ 5 00 2	30	0 33.7		-17 55 13
1540 1938 WK 15 <sup>m</sup> 6				420 Bertholda 12 <sup>m</sup> 3			
9 20	h 0 59.4	m 6.5	- 7 45 29 208°	9 20	h 1 01.8	m 4.9	+14 28 32 303°
28	0 52.9	6.8	- 8 14 24 0.486,	28	0 56.9	5.3	+13 56 38 0.529,
10 6	0 46.1	7.0	- 8 38 17 +9.1	10 6	0 51.6	5.5	+13 18 43 +5.0
14	0 39.1	6.3	- 8 55 7	14	0 46.1	5.2	+12 35 45
22	0 32.8	5.6	- 9 02 3 0.319	22	0 40.9	4.6	+11 50 46 0.378
30	0 27.2		- 8 59 12	30	0 36.3		+11 04 2
776 Berbericia 10 <sup>m</sup> 1				1463 1938 CB 14 <sup>m</sup> 0			
9 20	h 1 00.7	m 6.7	-25 31 35 345°	9 20	h 1 04.3	m 5.8	+14 51 4 340°
28	0 54.0	7.1	-26 06 16 0.395,	28	0 58.5	6.5	+14 47 14 0.410,
10 6	0 46.9	7.1	-26 22 6 +6.9	10 6	0 52.0	6.7	+14 33 21 +7.9
14	0 39.8	6.4	-26 16 27	14	0 45.3	6.4	+14 12 26
22	0 33.4	5.2	-25 49 48 0.196	22	0 38.9	5.4	+13 46 28 0.199
30	0 28.2		-25 01 2	30	0 33.5		+13 18 12
1049 Gotho 13 <sup>m</sup> 4				152 Atala 12 <sup>m</sup> 2			
9 12	h 1 06.0	m 5.9	+18 07 26 356°	9 20	h 1 06.8	m 6.1	- 3 25 21 285°
20	1 00.1	6.9	+18 33 16 0.432	28	1 00.7	6.5	- 3 46 18 0.490
28	0 53.2	7.6	+18 49 4 +106'	10 6	0 54.2	6.8	- 4 04 14 +70'
10 6	0 45.6	7.6	+18 53 6 9 <sup>m</sup> 9	14	0 47.4	6.3	- 4 18 7 7 <sup>m</sup> 1
14	0 38.0	7.2	+18 47 13 0.237	22	0 41.1	5.7	- 4 25 0 0.322*
22	0 30.8		+18 34 1	30	0 35.4		- 4 25 1
762 Pulcova 11 <sup>m</sup> 8				533 Sara 13 <sup>m</sup> 6			
9 20	h 1 01.5	m 6.0	+25 04 5 265°	9 20	h 1 05.8	m 5.2	+ 5 18 49 164°
28	0 55.5	6.5	+24 59 16 0.508	28	1 00.6	5.7	+ 4 29 51 0.492
10 6	0 49.0	6.7	+24 43 27 +56'	10 6	0 54.9	5.9	+ 3 38 51 +4.5
14	0 42.3	6.4	+24 16 37 7 <sup>m</sup> 3	14	0 49.0	5.5	+ 2 47 48
22	0 35.9	5.7	+23 39 43 0.355*	22	0 43.5	4.8	+ 1 59 42 0.323
30	0 30.2		+22 56 1	30	0 38.7		+ 1 17 2
465 Alekto 14 <sup>m</sup> 2				723 Hammonia 13 <sup>m</sup> 0			
9 20	h 1 00.9	m 5.6	+12 52 29 139°	9 20	h 1 07.9	m 5.2	+ 3 41 48 326°
28	0 55.3	5.9	+12 23 32 0.560	28	1 02.7	5.8	+ 2 53 50 0.456
10 6	0 49.4	6.0	+11 51 35 +35'	10 6	0 56.9	5.9	+ 2 03 49 +48'
14	0 43.4	5.6	+11 16 38 5 <sup>m</sup> 2	14	0 51.0	5.6	+ 1 14 44 9 <sup>m</sup> 6
22	0 37.8	5.0	+10 38 36 0.421	22	0 45.4	4.9	+ 0 30 37 0.270
30	0 32.8		+10 02 1	30	0 40.5		- 0 07 1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
825 Tanina 13 <sup>m</sup> 4				141 Lumen 10 <sup>m</sup> 1			
9 20	1 14.1	6.9	+ 1 41 49 160°	9 20	1 20.5	6.1	+26 59 42 4°
28	1 07.2	7.7	+ 0 52 50 0.377	28	1 14.4	7.5	+27 41 20 0.322
10 6	0 59.5	7.9	+ 0 02 46 +83	10 6 11	1 06.9	8.1	+28 01 0 +157
14	0 51.6	7.4	- 0 44 39 12 <sup>m</sup> 9	14	0 58.8	7.8	+28 01 20 20 <sup>m</sup> 6
22	0 44.2	6.4	- 1 23 29 0.142	22	0 51.0	6.7	+27 41 34 0.058*
30	0 37.8		- 1 52 1	30	0 44.3		+27 07 1
134 Sophrosyne 10 <sup>m</sup> 7				1342 Brabantia 15 <sup>m</sup> 1			
9 20	1 16.1	7.0	+17 10 18 319°	9 20	1 28.5	8.1	+39 49 36 217°
28	1 09.1	8.1	+17 28 6 0.373	28	1 20.4	9.5	+40 25 15 0.430
10 6	1 01.0	8.6	+17 34 6 +129	10 6 11	1 10.9	10.2	+40 40 7 +78
14	0 52.4	8.3	+17 28 14 13 <sup>m</sup> 4	14	1 00.7	10.3	+40 33 30 10 <sup>m</sup> 9
22	0 44.1	7.3	+17 14 19 0.139*	22	0 50.4	9.4	+40 03 50 0.260
30	0 36.8		+16 55 1	30	0 41.0		+39 13 1
1273 Helma 14 <sup>m</sup> 2				553 Kundry 13 <sup>m</sup> 2			
9 20	1 17.4	6.1	+18 36 11 23°	9 20	1 25.8	6.2	- 0 37 39 318°
28	1 11.3	7.2	+18 25 26 0.313	28	1 19.6	7.5	- 1 16 39 0.316
10 6	1 04.1	7.5	+17 59 40 +119	10 6 12	1 12.1	8.1	- 1 55 32 +133
14	0 56.6	7.1	+17 19 49 21 <sup>m</sup> 0	14	1 04.0	7.8	- 2 27 23 18 <sup>m</sup> 8
22	0 49.5	5.7	+16 30 51 0.031*	22	0 56.2	7.0	- 2 50 10 0.032
30	0 43.8		+15 39 7	30	0 49.2		- 3 00 1
769 Tatjana 12 <sup>m</sup> 7				642 Clara 13 <sup>m</sup> 5			
9 20	1 16.9	5.9	+ 2 17 25 75°	9 20	1 26.6	5.4	+10 47 12 278°
28	1 11.0	6.3	+ 1 52 24 0.495	28	1 21.2	6.1	+10 35 17 0.503
10 6	1 04.7	6.4	+ 1 28 24 +8	10 6 13	1 15.1	6.5	+10 18 20 +61
14	0 58.3	6.1	+ 1 04 18 7 <sup>m</sup> 0	14	1 08.6	6.6	+ 9 58 23
22	0 52.2	5.5	+ 0 46 14 0.328	22	1 02.0	6.1	+ 9 35 22 0.341
30	0 46.7		+ 0 32 2	30	0 55.9		+ 9 13 1
516 Amherstia 12 <sup>m</sup> 1				288 Glaue 13 <sup>m</sup> 6			
9 20	1 20.4	6.8	+22 53 6 140°	9 28	1 28.8	6.0	+ 2 57 42 175°
28	1 13.6	7.2	+22 47 16 0.518	10 6	1 22.8	6.4	+ 2 15 41 0.522
10 6	1 06.4	7.6	+22 31 27 +50	14	1 16.4	6.3	+ 1 34 39 +35
14	0 58.8	7.3	+22 04 33 6 <sup>m</sup> 0	22	1 10.1	6.0	+ 0 55 32 6 <sup>m</sup> 1
22	0 51.5	6.7	+21 31 39 0.368*	30	1 04.1	5.2	+ 0 23 25 0.369*
30	0 44.8		+20 52 1	11 7	0 58.9		- 0 02 1
933 Susi 15 <sup>m</sup> 2				297 Caecilia 12 <sup>m</sup> 9			
9 20	1 19.4	6.0	+ 1 23 57 237°	9 28	1 29.8	6.1	+18 01 13 47°
28	1 13.4	7.0	+ 0 26 59 0.420	10 6	1 23.7	6.5	+17 48 22 0.469
10 6	1 06.4	7.3	- 0 33 56 +53	14	1 17.2	6.6	+17 26 27 +67
14	0 59.1	7.1	- 1 29 48 10 <sup>m</sup> 5	22	1 10.6	6.1	+16 59 31 9 <sup>m</sup> 0
22	0 52.0	6.4	- 2 17 40 0.213	30	1 04.5	5.3	+16 28 32 0.292*
30	0 45.6		- 2 57 1	11 7	0 59.2		+15 56 1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
203 Pompeja				1428 1937 ND			
	h	m	°		h	m	°
9 28	1	30.6	+12 01	9 28	1	42.1	-19 19
10 6	1	24.3	+11 37	10 6	1	36.5	-20 21
14 15	1	17.4	+11 07	14 17	1	30.2	-21 07
22 15	1	10.4	+10 34	22 17	1	23.8	-21 31
30	1	03.9	+10 01	30	1	17.8	-21 32
11 7	0	58.4	+ 9 32	11 7	1	12.8	-21 12
			11 <sup>m</sup> 4				12 <sup>m</sup> 7
			339°				8°
			0.413				0.384
			+81				+5.0
			11 <sup>m</sup> 6				0.179
			0.201				5
			1*				
1533 1939 BD				470 Kilia			
	h	m	°		h	m	°
9 28	1	31.4	- 0 47	9 28	1	44.0	+ 5 49
10 6	1	26.1	- 1 44	10 6	1	37.8	+ 4 47
14 16	1	20.4	- 2 39	14 18	1	30.9	+ 3 44
22 16	1	14.7	- 3 28	22 18	1	23.9	+ 2 43
30	1	09.2	- 4 09	30	1	17.2	+ 1 49
11 7	1	04.6	- 4 40	11 7	1	11.4	+ 1 04
			15 <sup>m</sup> 5				13 <sup>m</sup> 4
			222°				162°
			0.492				0.418
			+3.6				+45
			0.327				11 <sup>m</sup> 0
			12				0.211
							1
255 Oppavia				881 Athene			
	h	m	°		h	m	°
9 28	1	37.5	+11 31	9 28	1	47.0	+34 58
10 6	1	30.8	+11 19	10 6	1	40.5	+34 45
14 16	1	23.5	+11 00	14 18	1	32.9	+34 09
22 16	1	16.1	+10 41	22 18	1	25.1	+33 11
30	1	09.0	+10 21	30	1	17.9	+31 57
11 7	1	02.5	+ 9 59	11 7	1	12.0	+30 32
			13 <sup>m</sup> 6				14 <sup>m</sup> 3
			223°				50°
			0.464				0.368
			+9.0				+66
			0.283				17 <sup>m</sup> 4
			2				0.146
							1
952 Caia				367 Amicitia			
	h	m	°		h	m	°
9 28	1	38.4	+ 9 28	9 28	1	50.2	+ 6 27
10 6	1	31.8	+ 9 40	10 6	1	43.5	+ 5 47
14 16	1	24.4	+ 9 48	14 19	1	35.7	+ 5 04
22 16	1	16.8	+ 9 53	22 19	1	27.5	+ 4 22
30	1	09.8	+ 9 59	30	1	19.6	+ 3 44
11 7	1	04.0	+10 07	11 7	1	12.6	+ 3 16
			11 <sup>m</sup> 8				12 <sup>m</sup> 7
			7°				257°
			0.357				0.360
			+144				+92
			15 <sup>m</sup> 4				14 <sup>m</sup> 4
			0.107				0.113
			1				1
171 Ophelia				543 Charlotte			
	h	m	°		h	m	°
9 28	1	39.8	+ 6 36	9 28	1	49.5	+25 07
10 6	1	34.5	+ 6 02	10 6	1	44.2	+25 01
14 17	1	28.6	+ 5 27	14 19	1	37.9	+24 42
22 17	1	22.6	+ 4 52	22 19	1	31.2	+24 10
30	1	16.8	+ 4 20	30	1	24.7	+23 28
11 7	1	11.6	+ 3 54	11 7	1	18.9	+22 40
			12 <sup>m</sup> 5				11 <sup>m</sup> 9
			243°				348°
			0.526				0.416
			+38				+5.6
			6 <sup>m</sup> 4				0.215
			0.374				2
			1*				
1038 Tuckia				939 Isberga			
	h	m	°		h	m	°
9 28	1	40.4	+ 0 42	9 28	1	53.6	+15 50
10 6	1	35.8	+ 0 25	10 6	1	47.0	+15 31
14 17	1	30.1	+ 0 10	14 19	1	39.2	+15 01
22 17	1	24.2	- 0 02	22 19	1	31.0	+14 23
30	1	18.7	- 0 08	30	1	23.4	+13 41
11 7	1	13.8	- 0 05	11 7	1	17.1	+13 02
			13 <sup>m</sup> 1				13 <sup>m</sup> 0
			8°				39°
			0.474				0.293
			+8.6				+144
			0.301				22 <sup>m</sup> 8
			2				9.988
							1

# OPPOSITION EPHEMERIDES

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
751 Faina				11 Parthenope			
	h m	° '	10 <sup>m</sup> 6		h m	° '	9 <sup>m</sup> 0
9 28	1 56.0	6.7 -15 29	0°	10 6	2 01.3	6.8 + 4 10	50 58°
10 6	1 49.3	7.7 -15 58	0.334	14	1 54.5	7.4 + 3 20	45 0.369
14	1 41.6	8.2 -16 10	+134'	22	1 47.1	7.1 + 2 35	38 +5.5
22	1 33.4	7.7 -16 01	17 <sup>m</sup> 0	30	1 40.0	6.4 + 1 57	28
30	1 25.7	6.7 -15 29	0.083	11 7	1 33.6	5.3 + 1 29	16 0.131
11 7	1 19.0	-14 37	1*	15	1 28.3	+ 1 13	2*
1059 1925 OA				1551 1938 DC <sub>1</sub>			
	h m	° '	14 <sup>m</sup> 3		h m	° '	15 <sup>m</sup> 0
9 28	1 54.4	5.6 +11 44	78°	9 28	2 02.0	5.8 + 5 35	41 43°
10 6	1 48.8	6.4 +10 39	0.418	10 6	1 56.2	7.0 + 4 54	43 0.359
14	1 42.4	6.6 + 9 29	+35'	14	1 49.2	7.5 + 4 11	41 +6.0
22	1 35.8	6.4 + 8 17	11 <sup>m</sup> 8	22	1 41.7	7.4 + 3 30	34
30	1 29.4	5.5 + 7 10	0.211	30	1 34.3	6.5 + 2 56	26 0.112
11 7	1 23.9	+ 6 08	1	11 7	1 27.8	+ 2 30	12
827 Wolfiana				312 Pieretta			
	h m	° '	13 <sup>m</sup> 8		h m	° '	12 <sup>m</sup> 9
9 28	1 54.3	5.1 + 8 50	14°	10 6	2 09.0	7.0 +18 08	10 110°
10 6	1 49.2	6.3 + 7 55	0.285	14	2 02.0	7.4 +17 58	18 0.475
14	1 42.9	6.9 + 6 54	+124'	22	1 54.6	7.5 +17 40	22 +7.8
22	1 36.0	6.6 + 5 53	24 <sup>m</sup> 6	30	1 47.1	7.2 +17 18	25
30	1 29.4	5.4 + 5 00	9.971	11 7	1 39.9	6.2 +16 53	24 0.301
11 7	1 24.0	+ 4 17	1	15	1 33.7	+16 29	2
1017 Jacqueline				250 Bettina			
	h m	° '	14 <sup>m</sup> 0		h m	° '	11 <sup>m</sup> 0
9 28	1 56.5	5.7 - 0 35	202°	10 6	2 10.6	6.4 +13 59	2 310°
10 6	1 50.8	6.5 - 1 25	0.448	14	2 04.2	7.2 +14 01	3 0.462
14	1 44.3	6.9 - 2 12	+53'	22	1 57.0	7.4 +13 58	4 +9.8
22	1 37.4	6.7 - 2 53	9 <sup>m</sup> 4	30	1 49.6	7.2 +13 54	6
30	1 30.7	6.1 - 3 26	0.259	11 7	1 42.4	6.4 +13 48	5 0.280
11 7	1 24.6	- 3 48	7	15	1 36.0	+13 43	2*
867 Kovacia				1445 Konkolya			
	h m	° '	13 <sup>m</sup> 9		h m	° '	13 <sup>m</sup> 6
9 28	1 58.2	5.3 + 8 04	285°	10 6	2 11.0	5.6 + 9 45	29 22°
10 6	1 52.9	6.2 + 7 42	0.479	14	2 05.4	6.2 + 9 16	30 0.419
14	1 46.7	6.5 + 7 18	+60'	22	1 59.2	6.4 + 8 46	30 +72
22	1 40.2	6.6 + 6 53	8 <sup>m</sup> 1	30	1 52.8	6.0 + 8 16	26 12 <sup>m</sup> 0
30	1 33.6	6.2 + 6 31	0.306	11 7	1 46.8	5.0 + 7 50	20 0.212
11 7	1 27.4	+ 6 12	1	15	1 41.8	+ 7 30	1
640 Brambilla				897 Lysistrata			
	h m	° '	13 <sup>m</sup> 2		h m	° '	13 <sup>m</sup> 9
10 6	1 56.6	5.5 +21 31	129°	10 6	2 14.3	6.5 +30 53	37 105°
14	1 51.1	5.8 +20 46	0.520	14	2 07.8	7.4 +30 16	54 0.418
22	1 45.3	5.9 +19 54	+18'	22	2 00.4	7.5 +29 22	68 +34
30	1 39.4	5.4 +18 56	7 <sup>m</sup> 5	30	1 52.9	7.1 +28 14	78 12 <sup>m</sup> 9
11 7	1 34.0	4.6 +17 56	0.366	11 7	1 45.8	6.0 +26 56	84 0.219
15	1 29.4	+16 57	1	15	1 39.8	+25 32	1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1031 Arctica 13 <sup>m</sup> 3				1314 Paula 13 <sup>m</sup> 7			
10	6	2 12.5 5.2 +18 12 59	235°	10	6	2 18.8 5.4 +23 53 18	344°
	14	2 07.3 5.8 +17 13 65	0.501		14	2 13.4 6.7 +23 35 36	0.283
	22	2 01.5 5.9 +16 08 70	+6'		22	2 06.7 7.4 +22 59 51	+4.8
	30	26 1 55.6 5.7 +14 58 70	8 <sup>m</sup> 2		30	1 59.3 7.1 +22 08 61	
11	7	1 49.9 5.0 +13 48 68	0.339	11	7	1 52.2 5.9 +21 07 66	9.970
	15	1 44.9 +12 40	1		15	1 46.3 +20 01	13
1371 Resi 15 <sup>m</sup> 1				484 Pittsburghia 12 <sup>m</sup> 9			
10	6	2 13.4 4.9 + 5 07 63	111°	10	6	2 23.3 5.8 - 5 52 57	68°
	14	2 08.5 5.4 + 4 04 62	0.524		14	2 17.5 6.5 - 6 49 49	0.418
	22	2 03.1 5.5 + 3 02 57	+10'		22	2 11.0 6.8 - 7 38 35	+57'
	30	26 1 57.6 5.3 + 2 05 52	7 <sup>m</sup> 1		30	2 04.2 6.5 - 8 13 22	11 <sup>m</sup> 3
11	7	1 52.3 4.7 + 1 13 43	0.372*	11	7	1 57.7 5.8 - 8 35 5	0.219
	15	1 47.6 + 0 30	1		15	1 51.9 - 8 40	1
1075 Helina 13 <sup>m</sup> 5				559 Nanon 12 <sup>m</sup> 7			
10	6	2 15.4 5.8 - 4 53 37	30°	10	6	2 25.6 5.8 - 0 13 42	149°
	14	2 09.6 6.4 - 5 30 29	0.438		14	2 19.8 6.6 - 0 55 39	0.457
	22	2 03.2 6.5 - 5 59 19	+67'		22	2 13.2 6.8 - 1 34 31	+53'
	30	26 1 56.7 6.2 - 6 18 6	10 <sup>m</sup> 3		30	2 06.4 6.7 - 2 05 23	8 <sup>m</sup> 9
11	7	1 50.5 5.5 - 6 24 7	0.249	11	7	1 59.7 6.1 - 2 28 10	0.276
	15	1 45.0 - 6 17	1		15	1 53.6 - 2 38	1
739 Mandeville 12 <sup>m</sup> 9				132 Aethra 12 <sup>m</sup> 0			
10	6	2 15.4 5.8 -15 20 65	215°	10	6	2 32.0 6.8 +42 13 17	289°
	14	2 09.6 6.3 -16 25 54	0.488		14	2 25.2 8.2 +41 56 37	0.430
	22	2 03.3 6.5 -17 19 39	+24'		22	2 17.0 9.1 +41 19 62	+16'
	30	26 1 56.8 6.2 -17 58 22	7 <sup>m</sup> 8		30	2 07.9 9.1 +40 17 83	13 <sup>m</sup> 0
11	7	1 50.6 5.6 -18 20 5	0.335	11	7	1 58.8 8.5 +38 54 104	0.253*
	15	1 45.0 -18 25	1		15	1 50.3 +37 10	1
1069 Planckia 13 <sup>m</sup> 7				325 Heidelbergia 11 <sup>m</sup> 4			
10	6	2 14.5 5.1 - 4 07 51	227°	10	6	2 29.6 5.5 +24 40 9	345°
	14	2 09.4 5.6 - 4 58 47	0.529		14	2 24.1 6.5 +24 49 0	0.425
	22	2 03.8 5.8 - 5 45 38	+3.9		22	2 17.6 7.2 +24 49 11	+81'
	30	26 1 58.0 5.6 - 6 23 29			30	2 10.4 7.1 +24 38 19	12 <sup>m</sup> 2
11	7	1 52.4 5.0 - 6 52 18	0.384	11	7	2 03.3 6.5 +24 19 26	0.228*
	15	1 47.4 - 7 10	5		15	1 56.8 +23 53	1
175 Andromache 11 <sup>m</sup> 5				1261 Legia 14 <sup>m</sup> 6			
10	6	2 16.1 5.7 +13 58 19	37°	10	6	2 30.1 5.1 +12 40 24	248°
	14	2 10.4 6.4 +13 39 23	0.447		14	2 25.0 5.9 +12 16 27	0.536
	22	2 04.0 6.5 +13 16 26	+66'		22	2 19.1 6.2 +11 49 28	+5.8
	30	26 1 57.5 6.2 +12 50 25	10 <sup>m</sup> 3		30	2 12.9 6.2 +11 21 29	
11	7	1 51.3 5.4 +12 25 22	0.258*	11	7	2 06.7 5.9 +10 52 26	0.388
	15	1 45.9 +12 03	1		15	2 00.8 +10 26	13



# OPPOSITION EPHEMERIDES

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1947		$\alpha_{1950}$		$\delta_{1950}$		Misc.		1947		$\alpha_{1950}$		$\delta_{1950}$		Misc.		
1 Ceres							7 <sup>m</sup> 6	1185 Nikko							13 <sup>m</sup> 2	
10	14	2	27.0	6.7	+	1 20	25	10	14	2	32.7	7.5	+	7 18	22	330°
	22	2	20.3	7.1	+	0 55	20		22	2	25.2	8.4	+	6 56	19	0.310
	30	2	13.2	7.2	+	0 35	13		30	2	16.8	8.4	+	6 37	13	+130
11	7	2	06.0	6.6	+	0 22	3	11	7	2	08.4	7.7	+	6 24	4	19 <sup>m</sup> 5
	15	1	59.4	5.6	+	0 19	6		15	2	00.7	6.2	+	6 20	7	0.022
	23	1	53.8		+	0 25			23	1	54.5		+	6 27	1	1*
1304 Arosa							13 <sup>m</sup> 8	712 Boliviana							10 <sup>m</sup> 2	
10	14	2	27.6	6.0	-	9 10	24	10	14	2	32.0	5.4	+	23 06	82	351°
	22	2	21.6	6.3	-	9 34	15		22	2	26.6	6.0	+	21 44	94	0.323
	30	2	15.3	6.2	-	9 49	4		30	2	20.6	6.2	+	20 10	104	+44
11	7	2	09.1	5.8	-	9 53	5	11	7	2	14.4	5.4	+	18 26	105	21 <sup>m</sup> 8
	15	2	03.3	5.1	-	9 48	17		15	2	09.0	4.2	+	16 41	100	0.047
	23	1	58.2		-	9 31			23	2	04.8		+	15 01	1	1*
156 Xanthippe							12 <sup>m</sup> 4	299 Thora							14 <sup>m</sup> 0	
10	14	2	28.8	6.4	+	21 40	41	10	14	2	34.9	6.8	+	16 38	36	6°
	22	2	22.4	6.8	+	20 59	46		22	2	28.1	7.5	+	16 02	43	0.358
	30	2	15.6	6.7	+	20 13	51		30	2	20.6	7.5	+	15 19	45	+78
11	7	2	08.9	6.2	+	19 22	53	11	7	2	13.1	6.9	+	14 34	44	16 <sup>m</sup> 1
	15	2	02.7	5.5	+	18 29	51		15	2	06.2	5.6	+	13 50	38	0.111
	23	1	57.2		+	17 38			23	2	00.6		+	13 12	1	1
391 Ingeborg							11 <sup>m</sup> 1	1153 Wallenbergia							13 <sup>m</sup> 7	
10	6	2	24.0	2.3	+	23 54	245	10	14	2	39.8	8.0	+	21 28	36	73°
	14	2	21.7	3.8	+	19 49	267		22	2	31.8	8.7	+	20 52	48	0.331
	22	2	17.9	4.3	+	15 22	270		30	2	23.1	8.6	+	20 04	53	+88
	30	2	13.6	3.8	+	10 52	249	11	7	2	14.5	7.7	+	19 11	55	18 <sup>m</sup> 6
11	7	2	09.8	2.8	+	6 43	214		15	2	06.8	6.2	+	18 16	52	0.062
	15	2	07.0		+	3 09			23	2	00.6		+	17 24	1	1
874 Rotraut							13 <sup>m</sup> 7	243 Ida							13 <sup>m</sup> 1	
10	6	2	28.2	4.7	+	9 31	49	10	14	2	38.9	6.1	+	17 12	26	329°
	14	2	23.5	5.4	+	8 42	51		22	2	32.8	6.8	+	16 46	30	0.440
	22	2	18.1	5.7	+	7 51	50		30	2	26.0	7.0	+	16 16	34	+5.2
	30	2	12.4	5.7	+	7 01	48	11	7	2	19.0	6.5	+	15 42	34	
11	7	2	06.7	5.3	+	6 13	42		15	2	12.5	5.7	+	15 08	31	0.246
	15	2	01.4		+	5 31			23	2	06.8		+	14 37	2	2*
242 Kriemhild							12 <sup>m</sup> 5	252 Clementina							12 <sup>m</sup> 6	
10	6	2	30.6	4.8	+	14 02	56	10	14	2	37.4	5.3	+	12 19	54	24°
	14	2	25.8	5.8	+	13 06	62		22	2	32.1	5.8	+	11 25	56	0.469
	22	2	20.0	6.2	+	12 04	65		30	2	26.3	5.9	+	10 29	54	+23
	30	2	13.8	6.3	+	10 59	64	11	7	2	20.4	5.4	+	9 35	49	9 <sup>m</sup> 6
11	7	2	07.5	5.8	+	9 55	60		15	2	15.0	4.8	+	8 46	43	0.291
	15	2	01.7		+	8 55			23	2	10.2		+	8 03	1	1*

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1461 1937 YL				162 Laurentia			
	h	m	°		h	m	°
10 14	2	39.8	5.8	10 14	2	45.8	6.0
22	2	34.0	6.3	22	2	39.8	6.7
30	2	27.7	6.4	30	2	33.1	7.1
11 7	2	21.3	6.1	11 7	2	26.0	6.8
15	2	15.2	5.3	15	2	19.2	6.3
23	2	09.9	—	23	2	12.9	+14
			— 7 16				50
			— 7 48				14 273°
			— 8 11				17 0.490
			— 8 23				20 +53
			— 8 21				21 7 <sup>m</sup> 8
			— 8 06				18 0.322
							1 *
			13 <sup>m</sup> 1				
			320°				
			0.479				
			+53				
			8 <sup>m</sup> 2				
			0.316				
			1*				
286 Iclea				1132 Hollandia			
	h	m	°		h	m	°
10 14	2	40.8	5.1	10 14	2	49.2	7.6
22	2	35.7	5.7	22	2	41.6	8.3
30	2	30.0	5.7	30	2	33.3	8.3
11 7	2	24.3	5.5	11 7	2	25.0	7.7
15	2	18.8	4.8	15	2	17.3	6.7
23	2	14.0	—	23	2	10.6	+15
			— 8 02				07
			— 9 00				11 71°
			— 9 49				15 0.419
			— 10 25				18 +75
			— 10 47				18 10 <sup>m</sup> 7
			— 10 55				17 0.214
							1
			13 <sup>m</sup> 2				
			337°				
			0.493				
			+24				
			8 <sup>m</sup> 2				
			0.338				
			1*				
1359 Prieska				1171 Rusthawelia			
	h	m	°		h	m	°
10 14	2	43.5	6.2	10 14	2	45.7	5.2
22	2	37.3	6.8	22	2	40.5	6.0
30	2	30.5	6.9	30	2	34.5	6.3
11 7	2	23.6	6.7	11 7	2	28.2	6.0
15	2	16.9	5.9	15	2	22.2	5.2
23	2	11.0	—	23	2	17.0	—
			+ 6 44				+10
			+ 6 32				51
			+ 6 22				30 353°
			+ 6 16				31 0.396
			+ 6 14				29 +71
			+ 6 20				24 14 <sup>m</sup> 0
							17 0.176
							1
			12 <sup>m</sup> 8				
			354°				
			0.464				
			+71				
			8 <sup>m</sup> 7				
			0.285				
			1				
894 Erda				1259 Ogyalla			
	h	m	°		h	m	°
10 14	2	41.4	5.4	10 14	2	48.8	5.6
22	2	36.0	5.8	22	2	43.2	6.1
30	2	30.2	5.8	30	2	37.1	6.3
11 7	2	24.4	5.6	11 7	2	30.8	6.1
15	2	18.8	4.8	15	2	24.7	5.6
23	2	14.0	—	23	2	19.1	+12
			+ 8 20				08
			+ 7 23				24 178°
			+ 6 25				26 0.546
			+ 5 32				27 +32
			+ 4 46				26 6 <sup>m</sup> 0
			+ 4 08				23 0.402
							1
			13 <sup>m</sup> 5				
			82°				
			0.492				
			+16				
			8 <sup>m</sup> 4				
			0.326				
			1				
334 Chicago				338 Budrosa			
	h	m	°		h	m	°
10 14	2	40.6	4.8	10 14	2	51.8	6.0
22	2	35.8	5.1	22	2	45.8	6.7
30	2	30.7	5.2	30	2	39.1	7.0
11 7	2	25.5	4.9	11 7	2	32.1	6.8
15	2	20.6	4.6	15	2	25.3	6.1
23	2	16.0	—	23	2	19.2	+22
			+ 9 16				11
			+ 8 49				19 0°
			+ 8 22				29 0.456
			+ 7 56				37 +42
			+ 7 34				42 10 <sup>m</sup> 5
			+ 7 16				45 0.273
							1 *
			12 <sup>m</sup> 1				
			97°				
			0.593				
			+25				
			5 <sup>m</sup> 1				
			0.467				
			1*				
51 Nemausa				564 Dudu			
	h	m	°		h	m	°
10 14	2	44.8	6.3	10 14	2	58.8	7.5
22	2	38.5	7.1	22	2	51.3	8.1
30	2	31.4	7.3	30	2	43.2	8.3
11 7	2	24.1	6.9	11 7	2	34.9	7.9
15	2	17.2	6.0	15	2	27.0	7.0
23	2	11.2	—	23	2	20.0	—
			+ 5 50				— 0
			+ 4 41				37 10 82°
			+ 3 34				3 0.453
			+ 2 33				5 +10.4
			+ 1 43				14
			+ 1 06				24 0.273
							2
			10 <sup>m</sup> 2				
			227°				
			0.394				
			+36				
			12 <sup>m</sup> 7				
			0.175				
			1*				

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
648 Pippa 12 <sup>m</sup> 2				890 Waltraut 13 <sup>m</sup> 8			
10 14	2 55.5	5.4 +31 40	6 323°	10 22	3 00.3	5.7 + 3 23	46 159°
22	2 50.1	6.5 +31 34	20 0.429	30	2 54.6	6.1 + 2 37	40 0.502
30	2 43.6	7.0 +31 14	33 +49'	11 7	2 48.5	6.1 + 1 57	34 +23'
11 7	2 36.6	7.0 +30 41	44 13 <sup>m</sup> 3	15	2 42.4	5.6 + 1 23	24 7 <sup>m</sup> 5
15	2 29.6	6.4 +29 57	53 0.237*	23	2 36.8	4.8 + 0 59	14 0.344
23	2 23.2	+29 04	1	12 1	2 32.0	+ 0 45	1
1427 1937 KB 13 <sup>m</sup> 3				1444 1938 AE 15 <sup>m</sup> 1			
10 14	3 00.9	6.7 + 6 07	17 58°	10 22	3 03.8	7.1 +41 30	9 151°
22	2 54.2	7.6 + 5 50	14 0.405	30	2 56.7	7.6 +41 21	22 0.548
30	2 46.6	7.7 + 5 36	8 +7.2	11 7	2 49.1	7.6 +40 59	35 +23'
11 7	2 38.9	7.5 + 5 28	2 7 <sup>m</sup> 6	15	2 41.5	7.1 +40 24	46 7 <sup>m</sup> 6
15	2 31.4	6.6 + 5 26	7 0.194	23	2 34.4	6.1 +39 38	54 0.417
23	2 24.8	+ 5 33	5	12 1	2 28.3	+38 44	1
1000 Piazzia 15 <sup>m</sup> 0				434 Hungaria 12 <sup>m</sup> 0			
10 14	3 00.4	6.8 +43 45	10 163°	10 22	3 05.0	7.4 -12 03	143 95°
22	2 53.6	7.4 +43 55	2 0.598	30	2 57.6	8.0 -14 26	112 0.294
30	2 46.2	7.9 +43 53	15 +24'	11 7	2 49.6	7.8 -16 18	77 +8'
11 7	2 38.3	7.8 +43 38	26 5 <sup>m</sup> 8	15	2 41.8	6.8 -17 35	42 21 <sup>m</sup> 4
15	2 30.5	7.2 +43 12	37 0.488	23	2 35.0	5.1 -18 17	7 0.024*
23	2 23.3	+42 35	1	12 1	2 29.9	-18 24	1
697 Galilea 11 <sup>m</sup> 9				365 Corduba 11 <sup>m</sup> 3			
10 14	3 06.4	7.2 +27 32	35 45°	10 22	3 02.6	5.4 + 5 25	80 3°
22	2 59.2	8.4 +28 07	22 0.415	30	2 57.2	6.1 + 4 05	73 0.375
30	2 50.8	8.9 +28 29	12 +7.6	11 7	2 51.1	6.1 + 2 52	63 +28'
11 7	2 41.9	8.9 +28 41	1 15 <sup>m</sup> 3	15	2 45.0	5.4 + 1 49	49 15 <sup>m</sup> 3
15	2 33.0	8.0 +28 42	8 0.211	23	2 39.6	4.4 + 1 00	32 0.145*
23	2 25.0	+28 34	2	12 1	2 35.2	+ 0 28	1
264 Libussa 11 <sup>m</sup> 3				7 Iris 6 <sup>m</sup> 8			
10 22	3 00.3	7.4 +13 27	7 11°	10 22	3 05.2	5.6 +25 18	44 2°
30	2 52.9	8.1 +13 34	7 0.384	30	2 59.6	6.3 +24 34	58 0.264
11 7	2 44.8	8.0 +13 41	7 +7.9	11 7	2 53.3	6.7 +23 36	68 +2.5
15	2 36.8	7.2 +13 48	8	15	2 46.6	5.8 +22 28	73
23	2 29.6	5.9 +13 56	13 0.156*	23	2 40.8	4.1 +21 15	68 9.929*
12 1	2 23.7	+14 09	2	12 1	2 36.7	+20 07	2
21 Lutetia 9 <sup>m</sup> 7				1307 Cimberia 13 <sup>m</sup> 0			
10 14	3 06.7	6.6 +13 35	24 57°	10 22	3 08.3	6.9 +19 31	47 331°
22	3 00.1	7.7 +13 11	25 0.357	30	3 01.4	7.7 +18 44	54 0.315
30	2 52.4	8.2 +12 46	26 +88'	11 7	2 53.7	8.0 +17 50	57 +3.4
11 7	2 44.2	7.9 +12 20	23 15 <sup>m</sup> 7	15	2 45.7	7.3 +16 53	57
15	2 36.3	6.9 +11 57	18 0.108*	23	2 38.4	5.7 +15 56	51 0.031*
23	2 29.4	+11 39	1	12 1	2 32.7	+15 05	5

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1352 Wawel				1452 1938 DZ <sub>1</sub>			
	h	m	°		h	m	°
10 22	3	07.5	+14 07 39	10 22	3	16.6	+26 23 23
30	3	01.3	+13 28 41	30	3	09.6	+26 46 15
11 7	2	54.6	+12 47 40	7 10	3	01.6	+27 01 6
15	2	47.8	+12 07 35	15	2	53.2	+27 07 0
23	2	41.3	+11 32 28	23	2	45.0	+27 07 6
12 1	2	35.9	+11 04	12 1	2	37.7	+27 01
			13 <sup>m</sup> 5				14 <sup>m</sup> 9
			5°				314°
			0.415				0.441
			+7.5				+85'
			0.213				10 <sup>m</sup> 6
			13				0.252
							1
426 Hippo				1495 1938 SW			
	h	m	°		h	m	°
10 22	3	13.9	+46 18 6	10 22	3	19.7	+28 54 11
30	3	06.0	+46 24 10	30	3	11.8	+29 05 1
11 7	2	57.2	+46 14 29	7 10	3	03.1	+29 06 9
15	2	48.1	+45 45 47	15	2	54.1	+28 57 17
23	2	39.5	+44 58 59	23	2	45.6	+28 40 22
12 1	2	32.0	+43 59	12 1	2	38.1	+28 18
			11 <sup>m</sup> 8				16 <sup>m</sup> 3
			251°				115°
			0.479				0.455
			+2.9				+6.5
			0.325				0.274
			2*				12
438 Zeuxo				889 Erynia			
	h	m	°		h	m	°
10 22	3	12.9	+16 21 10	10 22	3	18.6	+1 56 48
30	3	05.6	+16 11 12	30	3	13.1	+1 08 36
11 7	2	57.5	+15 59 14	7 11	3	06.5	+0 32 21
15	2	49.4	+15 45 13	15	2	59.5	+0 11 3
23	2	41.7	+15 32 9	23	2	53.0	+0 08 17
12 1	2	35.0	+15 23	12 1	2	47.8	+0 25
			12 <sup>m</sup> 1				11 <sup>m</sup> 7
			147°				357°
			0.431				0.290
			+68'				+106'
			10 <sup>m</sup> 2				23 <sup>m</sup> 9
			0.233				9.990
			1				1
616 Elly				451 Patientia			
	h	m	°		h	m	°
10 22	3	15.8	+36 44 34	10 22	3	24.9	+1 03 15
30	3	07.4	+37 18 18	30	3	18.7	+0 48 6
11 7	2	57.7	+37 36 1	7 12	3	12.0	+0 42 3
15	2	47.6	+37 35 16	15	3	04.9	+0 45 11
23	2	37.9	+37 19 30	23	2	58.0	+0 56 22
12 1	2	29.6	+36 49	12 1	2	51.7	+1 18
			12 <sup>m</sup> 5				10 <sup>m</sup> 3
			313°				338°
			0.390				0.456
			+97'				+7.7
			15 <sup>m</sup> 0				0.278
			0.178				14
			1				
710 Gertrud				1140 Crimea			
	h	m	°		h	m	°
10 22	3	12.2	+15 28 26	10 22	3	29.7	+7 04 6
30	3	06.5	+15 02 27	30	3	23.0	+7 10 9
11 7	3	00.4	+14 35 26	7 12	3	15.2	+7 19 15
15	2	54.1	+14 09 26	15	3	07.0	+7 34 21
23	2	48.1	+13 43 22	23	2	59.1	+7 55 29
12 1	2	42.7	+13 21	12 1	2	52.1	+8 24
			14 <sup>m</sup> 8				12 <sup>m</sup> 6
			169°				21°
			0.547				0.397
			+27'				+8.0
			6 <sup>m</sup> 1				0.180
			0.404				5
			1				
1202 Marina				1542 1941 QE			
	h	m	°		h	m	°
10 22	3	12.6	+17 14 14	10 22	3	26.3	+17 53 29
30	3	07.4	+17 00 16	30	3	20.7	+17 24 33
11 7	3	01.6	+16 44 18	7 13	3	14.5	+16 51 34
15	2	55.6	+16 26 16	15	3	07.9	+16 17 33
23	2	50.0	+16 10 15	23	3	01.5	+15 44 30
12 1	2	45.1	+15 55	12 1	2	55.8	+15 14
			13 <sup>m</sup> 9				15 <sup>m</sup> 0
			27°				29°
			0.512				0.447
			+43'				+3.3
			8 <sup>m</sup> 1				0.258
			0.354				12
			1*				

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1462 1938 CA <span style="float:right">16<sup>m</sup>3</span>				108 Hecuba <span style="float:right">11<sup>m</sup>7</span>			
10 22	h 30.1 <sup>m</sup>	°		10 30	h 49.7 <sup>m</sup>	°	
30	3 24.6 5.5	+19 31 17	214°	11 7	3 43.7 6.0	+25 34 8	268°
11 7	3 18.5 6.1	+19 14 21	0.536	15 18	3 36.9 6.8	+25 26 14	0.511
15	3 11.9 6.6	+18 53 23	+4.1	23	3 30.0 6.9	+24 53 19	+3.9
23	3 05.5 6.4	+18 05 25	0.389	12 1	3 23.2 6.8	+24 31 22	0.354
12 1	2 59.5 6.0	+17 42 23	12	9	3 17.2 6.0	+24 07 24	2*
790 Pretoria <span style="float:right">13<sup>m</sup>0</span>				163 Erigone <span style="float:right">10<sup>m</sup>6</span>			
10 30	h 33.3 <sup>m</sup>	°		10 30	h 51.8 <sup>m</sup>	°	
11 7	3 27.1 6.2	+29 47 44	106°	11 7	3 45.9 5.9	+11 41 44	331°
15	3 20.7 6.4	+29 03 51	0.558	15 19	3 38.7 7.2	+10 57 43	0.301
23	3 14.3 6.4	+28 12 56	-1.0	23	3 31.0 7.7	+10 14 36	+75
12 1	3 08.4 5.9	+27 16 59	0.422	12 1	3 23.7 7.3	+9 38 27	22 <sup>m</sup> 8
9	3 03.3 5.1	+26 17 59	2	9	3 17.6 6.1	+9 11 14	0.008
741 Botolphia <span style="float:right">13<sup>m</sup>1</span>				340 Eduarda <span style="float:right">12<sup>m</sup>2</span>			
10 30	h 35.6 <sup>m</sup>	°		10 30	h 54.4 <sup>m</sup>	°	
11 7	3 28.8 6.8	+8 37 21	258°	11 7	3 47.9 6.5	+23 20 2	352°
15	3 21.4 7.4	+8 16 15	0.443	15 19	3 40.2 7.7	+23 22 5	0.385
23	3 14.1 7.3	+8 01 11	+53	23	3 32.2 8.0	+23 17 10	+71
12 1	3 07.2 6.9	+7 50 3	9 <sup>m</sup> 7	12 1	3 24.6 7.6	+23 07 13	15 <sup>m</sup> 1
9	3 01.2 6.0	+7 47 5	0.254	9	3 17.9 6.7	+22 54 14	0.160
1166 Sakuntala <span style="float:right">14<sup>m</sup>4</span>				803 Picka <span style="float:right">13<sup>m</sup>2</span>			
10 30	h 40.7 <sup>m</sup>	°		10 30	h 53.7 <sup>m</sup>	°	
11 7	3 32.9 7.8	-7 34 15	90°	11 7	3 47.9 5.8	+24 12 31	85°
15	3 24.6 8.3	-7 49 1	0.421	15 19	3 41.6 6.3	+23 41 35	0.506
23	3 16.6 8.0	-7 48 17	+70	23	3 35.0 6.6	+23 06 39	+1.2
12 1	3 09.2 7.4	-7 31 34	9 <sup>m</sup> 9	12 1	3 28.6 6.4	+22 27 41	0.346
9	3 03.1 6.1	-6 57 47	0.234	9	3 23.0 5.6	+21 46 41	2*
730 Athanasia <span style="float:right">15<sup>m</sup>7</span>				1426 1937 GF <span style="float:right">14<sup>m</sup>4</span>			
10 30	h 44.0 <sup>m</sup>	°		10 30	h 57.9 <sup>m</sup>	°	
11 7	3 36.1 7.9	+14 53 24	204°	11 7	3 50.4 7.5	+33 35 1	167°
15	3 27.5 8.6	+14 29 24	0.418	15 20	3 41.9 8.5	+33 34 12	0.476
23	3 18.7 8.8	+14 05 23	+50	23	3 33.2 8.7	+33 22 21	+34
12 1	3 10.5 8.2	+13 42 19	10 <sup>m</sup> 5	12 1	3 24.7 8.5	+33 01 32	9 <sup>m</sup> 4
9	3 03.3 7.2	+13 23 14	0.213	9	3 17.2 7.5	+32 29 37	0.308
1157 Arabia <span style="float:right">14<sup>m</sup>3</span>				1269 Rollandia <span style="float:right">13<sup>m</sup>5</span>			
10 30	h 43.9 <sup>m</sup>	°		10 30	h 53.9 <sup>m</sup>	°	
11 7	3 37.3 6.6	+32 35 4	127°	11 7	3 49.1 4.8	+16 42 17	254°
15	3 30.1 7.2	+32 31 13	0.537	15 20	3 43.8 5.3	+16 25 19	0.607
23	3 22.9 7.2	+32 18 21	+29	23	3 38.4 5.4	+16 06 17	+3.5
12 1	3 16.0 6.9	+31 57 27	7 <sup>m</sup> 4	12 1	3 33.1 5.3	+15 49 16	0.487
9	3 09.9 6.1	+31 30 32	0.394	9	3 28.2 4.9	+15 33 14	2

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.		
937 Bethgea 14 <sup>m</sup> 2				161 Athor 11 <sup>m</sup> 2					
10 30	h 4 08.9	m 7.9	+22 25 35	79°	10 30	h 4 10.6	m 8.0	+29 32 20	94°
11 7	4 01.0	9.0	+21 50 42	0.349	11 7	4 02.6	9.4	+29 52 8	0.386
15 21	3 52.0	9.3	+21 08 46	+42'	15 22	3 53.2	9.9	+30 00 2	+70'
23	3 42.7	8.8	+20 22 45	17 <sup>m</sup> 3	23	3 43.3	9.5	+29 58 12	14 <sup>m</sup> 5
12 1	3 33.9	7.5	+19 37 42	0.097	12 1	3 33.8	8.5	+29 46 19	0.166*
9	3 26.4		+18 55	1	9	3 25.3		+29 27	1
1215 1932 BA 12 <sup>m</sup> 4				641 Agnes 13 <sup>m</sup> 6					
10 30	h 4 05.7	m 6.1	- 5 54 31	20°	10 30	h 4 07.7	m 6.3	+21 28 5	1°
11 7	3 59.6	7.2	- 6 25 13	0.355	11 7	4 01.4	7.9	+21 23 10	0.287
15 21	3 52.4	7.6	- 6 38 5	+5.2	15 22	3 53.5	8.7	+21 13 15	+103'
23	3 44.8	7.4	- 6 33 25	0.126*	23	3 44.8	8.6	+20 58 18	26 <sup>m</sup> 0
12 1	3 37.4	6.5	- 6 08 46	5	12 1	3 36.2	7.3	+20 40 17	9.978
9	3 30.9		- 5 22		9	3 28.9		+20 23	1
1319 Disa 14 <sup>m</sup> 6				779 Nina 11 <sup>m</sup> 2					
10 30	h 4 03.7	m 5.8	+22 14 18	223°	10 30	h 4 10.4	m 7.6	+38 52 25	64°
11 7	3 57.9	6.5	+21 56 22	0.543	11 7	4 02.8	8.8	+38 27 41	0.399
15 22	3 51.4	6.9	+21 34 26	+16'	15 22	3 54.0	9.1	+37 46 57	+8'
23	3 44.5	6.8	+21 08 27	6 <sup>m</sup> 4	23	3 44.9	8.5	+36 49 71	16 <sup>m</sup> 0
12 1	3 37.7	6.3	+20 41 26	0.400	12 1	3 36.4	7.4	+35 38 77	0.193*
9	3 31.4		+20 15	1	9	3 29.0		+34 21	1
64 Angelina 10 <sup>m</sup> 2				311 Cláudia 12 <sup>m</sup> 9					
10 30	h 4 05.2	m 6.0	+22 55 15	306°	10 30	h 4 08.1	m 6.0	+18 46 12	290°
11 7	3 59.2	7.3	+22 40 20	0.402	11 7	4 02.1	6.8	+18 34 14	0.446
15 22	3 51.9	7.8	+22 20 24	+46'	15 22	3 55.3	7.3	+18 20 15	+3.9
23	3 44.1	7.8	+21 56 28	13 <sup>m</sup> 9	23	3 48.0	7.2	+18 05 15	
12 1	3 36.3	7.1	+21 28 28	0.188*	12 1	3 40.8	6.6	+17 50 12	0.265
9	3 29.2		+21 00	1	9	3 34.2		+17 38	2
401 Ottilia 12 <sup>m</sup> 9				1064 Aethusa 14 <sup>m</sup> 0					
10 30	h 4 04.2	m 5.7	+23 20 4	147°	10 30	h 4 11.6	m 7.2	+31 31 22	101°
11 7	3 58.5	6.3	+23 16 6	0.541	11 7	4 04.4	8.2	+31 09 33	0.429
15 22	3 52.2	6.8	+23 10 11	+4.6	15 22	3 56.2	8.6	+30 36 43	+15'
23	3 45.4	6.6	+22 59 12	0.396	23	3 47.6	8.4	+29 53 50	12 <sup>m</sup> 4
12 1	3 38.8	6.1	+22 47 13	2	12 1	3 39.2	7.4	+29 03 55	0.235
9	3 32.7		+22 34		9	3 31.8		+28 08	1
382 Dodona 13 <sup>m</sup> 0				1400 Tirela 15 <sup>m</sup> 1					
10 30	h 4 05.5	m 5.9	+30 41 7	207°	11 7	h 4 04.1	m 6.3	+11 25 55	73°
11 7	3 59.6	6.8	+30 34 14	0.558	15	3 57.8	6.6	+10 30 52	0.489
15 22	3 52.8	7.0	+30 20 21	+17'	23 23	3 51.2	6.4	+ 9 38 45	-2'
23	3 45.8	7.0	+29 59 25	6 <sup>m</sup> 5	12 1	3 44.8	5.8	+ 8 53 37	8 <sup>m</sup> 4
12 1	3 38.8	6.5	+29 34 31	0.423*	9	3 39.0	4.8	+ 8 16 28	0.322*
9	3 32.3		+29 03	1	17	3 34.2		+ 7 48	7

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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
389 Industria				1026 Ingrid			
	h	m			h	m	
11 7	4 07.4	7.6	+29 57 26	11 7	4 16.6	8.5	+14 10 13
15	3 59.8	8.2	+29 31 36	15	4 08.1	9.2	+13 57 11
23	3 51.6	8.2	+28 55 45	23	3 58.9	9.1	+13 46 7
12 1 <sup>23</sup>	3 43.4	7.5	+28 10 48	12 1 <sup>24</sup>	3 49.8	8.2	+13 39 1
9	3 35.9	6.3	+27 22 51	9	3 41.6	6.6	+13 38 5
17	3 29.6		+26 31	17	3 35.0		+13 43
			11 <sup>m</sup> 3				14 <sup>m</sup> 9
			241°				84°
			0.431				0.357
			+23				+68
			12 <sup>m</sup> 2				15 <sup>m</sup> 4
			0.236*				0.111
			1				1
1457 Ankara				1499 1938 UF			
	h	m			h	m	
11 7	4 08.5	7.3	+28 34 19	11 7	4 14.5	7.4	+22 04 53
15	4 01.2	7.9	+28 15 26	15	4 07.1	7.7	+21 11 56
23	3 53.3	7.9	+27 49 32	23	3 59.4	7.7	+20 15 56
12 1 <sup>23</sup>	3 45.4	7.3	+27 17 36	12 1 <sup>25</sup>	3 51.7	6.9	+19 19 54
9	3 38.1	6.3	+26 41 36	9	3 44.8	5.9	+18 25 48
17	3 31.8		+26 05	17	3 38.9		+17 37
			14 <sup>m</sup> 9				15 <sup>m</sup> 7
			194°				88°
			0.492				0.438
			+20				0.0
			8 <sup>m</sup> 4				0.245
			0.328				12
			1				
1234 Elyna				351 Yrsa			
	h	m			h	m	
10 30	4 13.7	5.9	+33 10 5	11 7	4 17.8	6.7	+11 06 7
11 7	4 07.8	7.1	+33 05 16	15	4 11.1	7.6	+10 59 3
15	4 00.7	7.7	+32 49 27	23	4 03.5	7.8	+10 56 2
23	3 53.0	7.6	+32 22 35	12 1 <sup>25</sup>	3 55.7	7.4	+10 58 10
12 1	3 45.4	6.9	+31 47 43	9	3 48.3	6.5	+11 08 17
9	3 38.5		+31 04	17	3 41.8		+11 25
			13 <sup>m</sup> 9				11 <sup>m</sup> 8
			25°				308°
			0.442				0.407
			+29				+60
			12 <sup>m</sup> 6				12 <sup>m</sup> 2
			0.253				0.196*
			1				1
1341 Edmee				576 Emanuela			
	h	m			h	m	
10 30	4 14.2	6.0	+ 5 31 18	11 7	4 19.3	7.4	+34 40 17
11 7	4 08.2	6.9	+ 5 13 12	15	4 11.9	8.0	+34 23 26
15	4 01.3	7.4	+ 5 01 6	23	4 03.9	7.9	+33 57 37
23	3 53.9	7.3	+ 4 55 3	12 1 <sup>25</sup>	3 56.0	7.4	+33 20 43
12 1	3 46.6	6.7	+ 4 58 11	9	3 48.6	6.3	+32 37 48
9	3 39.9		+ 5 09	17	3 42.3		+31 49
			14 <sup>m</sup> 2				12 <sup>m</sup> 7
			170°				76°
			0.470				0.472
			+5.7				+15
			0.300				10 <sup>m</sup> 8
			13				0.300
							1
444 Gyptis				955 Alstede			
	h	m			h	m	
11 7	4 09.2	6.3	+10 26 53	11 7	4 23.0	8.3	+35 46 3
15	4 02.9	7.1	+ 9 33 49	15	4 14.7	9.1	+35 49 8
23	3 55.8	6.9	+ 8 44 40	23	4 05.6	9.0	+35 41 18
12 1 <sup>24</sup>	3 48.9	6.3	+ 8 04 29	12 1 <sup>26</sup>	3 56.6	8.6	+35 23 27
9	3 42.6	5.1	+ 7 35 17	9	3 48.0	7.6	+34 56 33
17	3 37.5		+ 7 18	17	3 40.4		+34 23
			10 <sup>m</sup> 7				15 <sup>m</sup> 3
			53°				135°
			0.406				0.506
			+1.4				+27
			0.198*				8 <sup>m</sup> 0
			2				0.351
							1
1546 1941 SG <sub>1</sub>				1002 Olbersia			
	h	m			h	m	
11 7	4 07.6	5.6	+ 3 59 62	11 7	4 28.0	7.9	+37 52 10
15	4 02.0	6.1	+ 2 57 54	15	4 20.1	8.9	+38 02 4
23	3 55.9	6.1	+ 2 03 44	23	4 11.2	9.1	+37 58 18
12 1 <sup>24</sup>	3 49.8	5.7	+ 1 19 30	12 1 <sup>27</sup>	4 02.1	8.6	+37 40 29
9	3 44.1	4.9	+ 0 49 18	9	3 53.5	7.3	+37 11 38
17	3 39.2		+ 0 31	17	3 46.2		+36 33
			13 <sup>m</sup> 6				13 <sup>m</sup> 8
			326°				72°
			0.451				0.433
			0				+38
			10 <sup>m</sup> 4				13 <sup>m</sup> 4
			0.272				0.244
			1				1



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1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
335 Roberta $12^m 2$				806 Gyldenja $13^m 4$			
11	7	h 4 27.9 7.3	+13 53 25	11	7	h 4 33.8 6.6	+27 55 24
	15	4 20.6 7.9	+13 28 23		15	4 27.2 7.5	+28 19 19
	23	4 12.7 8.1	+13 05 19		23	4 19.7 8.0	+28 38 13
12	1 <sup>27</sup>	4 04.6 7.6	+12 46 14	12	1 <sup>28</sup>	4 11.7 7.9	+28 51 8
	9	3 57.0 6.8	+12 32 8		9	4 03.8 7.3	+28 59 3
	17	3 50.2	+12 24 1		17	3 56.5	+29 02 1
1222 Tina $15^m 2$				808 Merxia $12^m 4$			
11	7	h 4 30.1 7.2	+24 45 56	11	7	h 4 32.8 5.9	+15 27 32
	15	4 22.9 7.8	+23 49 62		15	4 26.9 6.8	+14 55 31
	23	4 15.1 7.9	+22 47 64		23	4 20.1 7.3	+14 24 28
12	1 <sup>27</sup>	4 07.2 7.4	+21 43 63	12	1 <sup>28</sup>	4 12.8 7.2	+13 56 23
	9	3 59.8 6.4	+20 40 61		9	4 05.6 6.3	+13 33 15
	17	3 53.4	+19 39 13		17	3 59.3	+13 18 2
1092 Lilium $14^m 0$				686 Gersuind $13^m 6$			
11	7	h 4 28.6 6.6	+28 53 10	11	7	h 4 36.4 7.6	+23 48 70
	15	4 22.0 7.4	+28 43 18		15	4 28.8 8.4	+22 38 76
	23	4 14.6 7.6	+28 25 23		23	4 20.4 8.5	+21 22 77
12	1 <sup>28</sup>	4 07.0 7.4	+28 02 28	12	1 <sup>28</sup>	4 11.9 7.9	+20 05 73
	9	3 59.6 6.5	+27 34 31		9	4 04.0 6.6	+18 52 67
	17	3 53.1	+27 03 1		17	3 57.4	+17 45 7
1035 Amata $14^m 4$				269 Justitia $13^m 6$			
11	7	h 4 32.9 8.1	+44 17 27	11	7	h 4 37.4 6.6	+14 16 24
	15	4 24.8 9.1	+44 44 13		15	4 30.8 7.3	+13 52 22
	23	4 15.7 9.4	+44 57 2		23	4 23.5 7.6	+13 30 20
12	1 <sup>28</sup>	4 06.3 9.0	+44 55 15	12	1 <sup>29</sup>	4 15.9 7.4	+13 10 15
	9	3 57.3 8.1	+44 40 28		9	4 08.5 6.7	+12 55 11
	17	3 49.2	+44 12 1		17	4 01.8	+12 44 1
910 Anneliese $13^m 9$				166 Rhodope $11^m 3$			
11	7	h 4 31.2 6.7	+24 31 4	11	7	h 4 39.4 5.8	+ 1 55 20
	15	4 24.5 7.3	+24 35 0		15	4 33.6 7.0	+ 1 35 6
	23	4 17.2 7.6	+24 35 3		23	4 26.6 7.4	+ 1 29 10
12	1 <sup>28</sup>	4 09.6 7.4	+24 32 5	12	1 <sup>30</sup>	4 19.2 7.2	+ 1 39 26
	9	4 02.2 6.8	+24 27 7		9	4 12.0 6.2	+ 2 05 41
	17	3 55.4	+24 20 1		17	4 05.8	+ 2 46 1
698 Ernestina $13^m 6$				73 Klytia $11^m 8$			
11	7	h 4 33.6 6.9	+28 02 26	11	7	h 4 41.7 6.5	+25 17 3
	15	4 26.7 8.1	+28 28 18		15	4 35.2 7.6	+25 14 8
	23	4 18.6 8.6	+28 46 12		23	4 27.6 8.2	+25 06 14
12	1 <sup>28</sup>	4 10.0 8.5	+28 58 6	12	1 <sup>30</sup>	4 19.4 8.0	+24 52 17
	9	4 01.5 7.7	+29 04 0		9	4 11.4 7.3	+24 35 19
	17	3 53.8	+29 04 1		17	4 04.1	+24 16 1

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
419 Aurelia				347 Pariana			
	h	m			h	m	
11 15	4 43.7	7.5	+20 47 22	11 15	4 53.6	7.4	+16 02 12
23	4 36.2	7.8	+20 25 24	23	4 46.2	8.3	+16 14 14
12 1	4 28.4	7.7	+20 01 24	12 1	4 37.9	8.6	+16 28 16
9	4 20.7	7.3	+19 37 23	9	4 29.3	8.3	+16 44 19
17	4 13.4	6.2	+19 14 21	17	4 21.0	7.4	+17 03 23
25	4 07.2		+18 53	25	4 13.6		+17 26
			12 <sup>m</sup> 2				12 <sup>m</sup> 0
			144°				279°
			0.501				0.419
			+12'				+60'
			7 <sup>m</sup> 5				11 <sup>m</sup> 3
			0.338*				0.215*
			1				1
17 Thetis				1418 Fayeta			
	h	m			h	m	
11 15	4 44.2	7.6	+14 49 14	11 15	4 58.8	9.7	+34 13 8
23	4 36.6	8.1	+14 35 12	23	4 49.1	10.7	+34 21 6
12 1	4 28.5	8.1	+14 23 9	12 1	4 38.4	10.6	+34 15 19
9	4 20.4	7.5	+14 14 3	9	4 27.8	9.7	+33 56 28
17	4 12.9	6.4	+14 11 1	17	4 18.1	8.0	+33 28 37
25	4 06.5		+14 12	25	4 10.1		+32 51
			10 <sup>m</sup> 8				13 <sup>m</sup> 8
			162°				91°
			0.445				0.368
			+31'				+42'
			9 <sup>m</sup> 7				17 <sup>m</sup> 1
			0.257*				0.134
			1				1
458 Hercynia				1502 Arenda			
	h	m			h	m	
11 15	4 42.1	6.1	+ 1 16 11	11 15	4 52.8	6.6	+18 21 27
23	4 36.0	6.7	+ 1 05 2	23	4 46.2	7.3	+17 54 26
12 1	4 29.3	6.7	+ 1 07 18	12 1	4 38.9	7.6	+17 28 26
9	4 22.6	6.0	+ 1 25 34	9	4 31.3	7.2	+17 02 21
17	4 16.6	4.8	+ 1 59 47	17	4 24.1	6.1	+16 41 17
25	4 11.8		+ 2 46	25	4 18.0		+16 24
			11 <sup>m</sup> 5				14 <sup>m</sup> 0
			10°				321°
			0.360				0.407
			+61'				+20'
			16 <sup>m</sup> 5				13 <sup>m</sup> 4
			0.127*				0.196
			1				1
535 Montague				530 Turandot			
	h	m			h	m	
11 15	4 51.8	7.4	+18 50 4	11 15	4 51.7	6.1	+11 43 12
23	4 44.4	8.2	+18 54 4	23	4 45.6	6.7	+11 31 6
12 1	4 36.2	8.4	+18 58 5	12 1	4 38.9	6.7	+11 25 2
9	4 27.8	7.9	+19 03 5	9	4 32.2	6.3	+11 23 3
17	4 19.9	6.8	+19 08 8	17	4 25.9	5.5	+11 26 8
25	4 13.1		+19 16	25	4 20.4		+11 34
			11 <sup>m</sup> 8				12 <sup>m</sup> 4
			287°				76°
			0.407				0.504
			+52'				+28'
			12 <sup>m</sup> 7				7 <sup>m</sup> 8
			0.195*				0.345
			1				1
306 Unitas				781 Kartvelia			
	h	m			h	m	
11 15	4 52.5	7.8	+11 00 19	11 15	4 52.1	5.7	- 2 35 18
23	4 44.7	8.4	+10 41 13	23	4 46.4	6.1	- 2 53 9
12 1	4 36.3	8.5	+10 28 6	12 1	4 40.3	6.2	- 3 02 2
9	4 27.8	7.8	+10 22 2	9	4 34.1	5.9	- 3 00 14
17	4 20.0	6.6	+10 24 10	17	4 28.2	5.3	- 2 46 24
25	4 13.4		+10 34	25	4 22.9		- 2 22
			11 <sup>m</sup> 1				13 <sup>m</sup> 5
			105°				146°
			0.397				0.539
			+38'				+33'
			12 <sup>m</sup> 5				7 <sup>m</sup> 5
			0.182*				0.405
			1				1
1147 Stavropolis				70 Panopaea			
	h	m			h	m	
11 15	4 54.1	8.5	+24 31 21	11 15	5 00.2	8.1	+28 34 21
23	4 45.6	9.2	+24 10 27	23	4 52.1	9.0	+28 55 15
12 1	4 36.4	9.2	+23 43 29	12 1	4 43.1	9.1	+29 10 7
9	4 27.2	8.6	+23 14 31	9	4 34.0	8.7	+29 17 3
17	4 18.6	7.2	+22 43 30	17	4 25.3	7.6	+29 20 3
25	4 11.4		+22 13	25	4 17.7		+29 17
			15 <sup>m</sup> 4				11 <sup>m</sup> 5
			135°				113°
			0.430				0.457
			+16'				+45'
			10 <sup>m</sup> 9				10 <sup>m</sup> 0
			0.232				0.276*
			1				1

## OPPOSITION EPHEMERIDES

1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947	$\alpha_{1950}$	$\delta_{1950}$	Misc.
25 Phocaea				1396 1936 PF			
	h	m	°		h	m	°
11 15	4	59.1	7.7	11 15	5	12.7	8.2
23	4	51.4	8.2	23	5	04.5	9.5
12 1	4	43.2	8.2	12 1	4	55.0	9.8
9	4	35.0	7.7	9	4	45.2	9.6
17	4	27.3	6.5	17	4	35.6	8.6
25	4	20.8	+ 0	25	4	27.0	+28
			15				41
			78				23
			69				1
			54				
			39				
			23				
			1				
			102°				166°
			0.423				0.416
			-20'				+26'
			10 <sup>m</sup> 4				12 <sup>m</sup> 5
			0.231*				0.212
			1				1
349 Dembowska				65 Cybele			
	h	m	°		h	m	°
11 15	5	00.0	7.2	11 15	5	09.5	5.4
23	4	52.8	8.0	23	5	04.1	5.9
12 1	4	44.8	8.4	12 1	4	58.2	6.2
9	4	36.4	7.9	9	4	52.0	6.1
17	4	28.5	6.9	17	4	45.9	5.6
25	4	21.6	+30	25	4	40.3	+17
			01				21
			17				11
			11				10
			3				10
			4				8
			8				7
			48°				172°
			0.440				0.586
			+3.1				+1.6
			0.251*				0.458*
			2				2
1219 Britta				579 Sidonia			
	h	m	°		h	m	°
11 15	5	03.2	7.5	11 15	5	12.6	6.3
23	4	55.7	9.0	23	5	06.3	7.1
12 1	4	46.7	9.5	12 1	4	59.2	7.5
9	4	37.2	9.0	9	4	51.7	7.4
17	4	28.2	7.4	17	4	44.3	6.8
25	4	20.8	+26	25	4	37.5	+20
			03				30
			22				12
			15				11
			7				11
			2				12
			3				13
			6°				113°
			0.287				0.493
			+87'				+4.3
			27 <sup>m</sup> 1				0.328*
			9.980				2
			1				
352 Gisela				1156 Kira			
	h	m	°		h	m	°
11 15	5	03.2	7.4	11 15	5	16.0	7.1
23	4	55.8	8.6	23	5	08.9	8.5
12 1	4	47.2	8.9	12 1	5	00.4	9.2
9	4	38.3	8.1	9	4	51.2	9.0
17	4	30.2	6.5	17	4	42.2	8.1
25	4	23.7	+23	25	4	34.1	+21
			14				08
			33				4
			37				6
			39				8
			38				10
			33				8
			31°				301°
			0.285				0.346
			+39'				+41'
			26 <sup>m</sup> 9				18 <sup>m</sup> 4
			9.974*				0.092
			1				1
350 Ornamenta				1178 Irmela			
	h	m	°		h	m	°
11 15	5	04.0	7.0	11 15	5	15.4	5.8
23	4	57.0	8.0	23	5	09.6	7.1
12 1	4	49.0	8.4	12 1	5	02.5	7.6
9	4	40.6	8.2	9	4	54.9	7.7
17	4	32.4	7.2	17	4	47.2	7.2
25	4	25.2	+ 6	25	4	40.0	+11
			13				38
			42				27
			53				25
			61				18
			70				12
			75				5
			2°				291°
			0.417				0.415
			+98'				+17'
			11 <sup>m</sup> 0				12 <sup>m</sup> 3
			0.217*				0.212*
			1				1
777 Gutemberga				331 Etheridgea			
	h	m	°		h	m	°
11 15	5	03.2	6.5	11 15	5	19.8	6.4
23	4	56.7	7.4	23	5	13.4	7.3
12 1	4	49.3	7.6	12 1	5	06.1	7.9
9	4	41.7	7.4	9	4	58.2	7.9
17	4	34.3	6.7	17	4	50.3	7.1
25	4	27.6	+34	25	4	43.2	+29
			02				44
			17				11
			26				7
			33				0
			41				5
			46				11
			284°				69°
			0.500				0.470
			-4'				+2.1
			9 <sup>m</sup> 6				0.296*
			0.341*				2
			1				

1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
443 Photographica 12 <sup>m</sup> 4				431 Nephele 12 <sup>m</sup> 8			
11 23	5 15.8	8.0	+15 52	11 23	5 25.0	6.6	+21 29
12 1	5 07.8	8.9	+15 29	12 1	5 18.4	7.0	+21 24
9	4 58.9	8.9	+15 10	9	5 11.4	7.1	+21 19
17	4 50.0	8.0	+14 56	17	5 04.3	6.7	+21 13
25	4 42.0	6.5	+14 49	25	4 57.6	5.8	+21 08
1 2	4 35.5		+14 49	1 2	4 51.8		+21 03
			277°				88°
			0.344				0.506
			+27'				+15'
			17 <sup>m</sup> 4				8 <sup>m</sup> 3
			0.089				0.346
			1*				1
505 Cava 10 <sup>m</sup> 3				294 Felicia 13 <sup>m</sup> 8			
11 23	5 17.2	7.0	+16 12	11 23	5 24.6	6.4	+15 34
12 1	5 10.2	7.9	+16 52	12 1	5 18.2	6.8	+15 27
9	5 02.3	7.9	+17 38	9	5 11.4	6.9	+15 23
17	4 54.4	7.1	+18 26	17	5 04.5	6.4	+15 22
25	4 47.3	5.5	+19 17	25	4 58.1	5.7	+15 25
1 2	4 41.8		+20 09	1 2	4 52.4		+15 30
			6°				93°
			0.308				0.524
			+99'				+16'
			23 <sup>m</sup> 2				7 <sup>m</sup> 1
			0.021				0.374
			1*				1*
1369 1935 QB 14 <sup>m</sup> 4				927 Ratisbona 12 <sup>m</sup> 8			
11 15	5 16.2	5.5	+ 4 46	11 23	5 28.2	7.7	+42 34
23	5 10.7	6.2	+ 4 14	12 1	5 20.5	8.7	+43 01
12 1	5 04.5	6.4	+ 3 49	9	5 11.8	9.0	+43 17
9	4 58.1	6.3	+ 3 31	17	5 02.8	8.5	+43 19
17	4 51.8	5.9	+ 3 22	25	4 54.3	7.5	+43 08
25	4 45.9		+ 3 22	1 2	4 46.8		+42 46
			107°				305°
			0.535				0.482
			+5'				+30'
			6 <sup>m</sup> 4				11 <sup>m</sup> 8
			0.395				0.321
			1				1*
296 Phaetusa 12 <sup>m</sup> 7				1280 Baillauda 13 <sup>m</sup> 8			
11 15	5 23.8	7.0	+20 33	11 23	5 25.2	6.3	+28 53
23	5 16.8	8.5	+20 28	12 1	5 18.9	6.8	+28 43
12 1	5 08.3	9.3	+20 22	9	5 12.1	7.0	+28 28
9	4 59.0	9.0	+20 16	17	5 05.1	6.5	+28 10
17	4 50.0	7.8	+20 11	25	4 58.6	5.7	+27 48
25	4 42.2		+20 08	1 2	4 52.9		+27 24
			47°				72°
			0.306				0.528
			+51'				0.0
			22 <sup>m</sup> 8				0.378
			0.017				2*
			1				
404 Arsinoe 13 <sup>m</sup> 7				875 Nymphe 14 <sup>m</sup> 2			
11 23	5 19.0	7.6	+15 54	11 23	5 27.1	7.0	+ 4 29
12 1	5 11.4	8.4	+16 08	12 1	5 20.1	7.6	+ 3 46
9	5 03.0	8.4	+16 25	9	5 12.5	7.6	+ 3 13
17	4 54.6	8.1	+16 45	17	5 04.9	7.1	+ 2 52
25	4 46.5	7.1	+17 07	25	4 57.8	6.1	+ 2 44
1 2	4 39.4		+17 32	1 2	4 51.7		+ 2 47
			243°				110°
			0.463				0.437
			+45'				-2'
			8 <sup>m</sup> 6				10 <sup>m</sup> 2
			0.284				0.252
			1				1
1216 Askania 15 <sup>m</sup> 1				1531 1938 SH 13 <sup>m</sup> 5			
11 23	5 26.0	8.2	+14 22	11 23	5 31.4	7.6	+32 44
12 1	5 17.8	9.0	+14 19	12 1	5 23.8	8.6	+32 00
9	5 08.8	9.0	+14 20	9	5 15.2	8.7	+31 04
17	4 59.8	8.5	+14 25	17	5 06.5	7.9	+29 59
25	4 51.3	7.3	+14 35	25	4 58.6	6.4	+28 48
1 2	4 44.0		+14 50	1 2	4 52.2		+27 35
			169°				13°
			0.419				0.350
			+32'				-23'
			10 <sup>m</sup> 8				20 <sup>m</sup> 5
			0.217				0.101
			1				1*

## OPPOSITION EPHEMERIDES

1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
1267 Geertruida 15 <sup>m</sup> 0				317 Roxane 12 <sup>m</sup> 3			
11 23	h m	°		11 23	h m	°	
12 1	5 35.2 8.2	+28 50	9 137°	12 1	5 49.1 7.5	+20 37	6 96°
9	5 27.0 8.9	+28 59	2 0.451	9	5 41.6 8.6	+20 31	5 0.365
17 12	5 18.1 9.2	+29 01	4 +20'	17 15	5 33.0 9.2	+20 26	4 +20'
25	5 08.9 8.6	+28 57	9 10 <sup>m</sup> 5	25	5 23.8 8.9	+20 22	4 16 <sup>m</sup> 3
1 2	5 00.3 7.6	+28 48	13 0.266	1 2	5 14.9 7.8	+20 18	2 0.127*
	4 52.7	+28 35	1		5 07.1	+20 16	1
597 Bandusia 12 <sup>m</sup> 8				1436 1936 YA 13 <sup>m</sup> 6			
11 23	h m	°		11 23	h m	°	
12 1	5 37.2 8.4	+35 46	38 83°	12 1	5 46.1 6.1	+24 13	28 144°
9	5 28.8 9.5	+36 24	28 0.427	9	5 40.0 6.9	+23 45	30 0.518
17 12	5 19.3 9.8	+36 52	15 +43'	17 15	5 33.1 7.2	+23 15	32 -19'
25	5 09.5 9.3	+37 07	3 13 <sup>m</sup> 5	25	5 25.9 7.0	+22 43	32 7 <sup>m</sup> 9
1 2	5 00.2 8.0	+37 10	6 0.233	1 2	5 18.9 6.4	+22 11	32 0.364*
	4 52.2	+37 04	1		5 12.5	+21 39	1
671 Carnegia 12 <sup>m</sup> 7				357 Ninina 11 <sup>m</sup> 9			
11 23	h m	°		11 23	h m	°	
12 1	5 33.9 6.9	+34 40	14 345°	12 1	5 46.4 5.6	+ 4 17	6 41°
9	5 27.0 7.9	+34 54	5 0.462	9	5 40.8 6.4	+ 4 11	4 0.470
17 13	5 19.1 8.2	+34 59	4 +19'	17 15	5 34.4 6.7	+ 4 15	13 +3.1
25	5 10.9 7.8	+34 55	12 11 <sup>m</sup> 9	25	5 27.7 6.6	+ 4 28	24
1 2	5 03.1 6.9	+34 43	19 0.286	1 2	5 21.1 6.1	+ 4 52	33 0.302
	4 56.2	+34 24	1		5 15.0	+ 5 25	2
1146 Biarmia 14 <sup>m</sup> 5				795 Fini 13 <sup>m</sup> 0			
11 23	h m	°		11 23	h m	°	
12 1	5 31.8 5.8	+ 8 01	33 156°	12 1	5 55.9 8.4	+47 44	53 250°
9	5 26.0 6.3	+ 7 28	29 0.575	9	5 47.5 10.1	+48 37	39 0.458
17 13	5 19.7 6.4	+ 6 59	22 -10'	17 16	5 37.4 11.0	+49 16	21 +32'
25	5 13.3 6.2	+ 6 37	15 5 <sup>m</sup> 1	25	5 26.4 11.1	+49 37	3 13 <sup>m</sup> 9
1 2	5 07.1 5.6	+ 6 22	9 0.447	1 2	5 15.3 10.1	+49 40	15 0.293
	5 01.5	+ 6 13	1		5 05.2	+49 25	1
729 Watsonia 13 <sup>m</sup> 2				819 Barnardiana 14 <sup>m</sup> 2			
11 23	h m	°		11 23	h m	°	
12 1	5 41.2 6.3	+ 3 31	1 238°	12 1	5 57.6 8.2	+30 54	7 161°
9	5 34.9 7.1	+ 3 32	10 0.466	9	5 49.4 9.6	+31 01	1 0.397
17 14	5 27.8 7.5	+ 3 42	22 +38'	17 16	5 39.8 10.3	+31 00	10 +6'
25	5 20.3 7.4	+ 4 04	31 8 <sup>m</sup> 7	25	5 29.5 10.1	+30 50	17 14 <sup>m</sup> 2
1 2	5 12.9 6.8	+ 4 35	42 0.296	1 2	5 19.4 9.0	+30 33	24 0.182
	5 06.1	+ 5 17	1		5 10.4	+30 09	1
104 Klymene 11 <sup>m</sup> 2				977 Philippa 13 <sup>m</sup> 1			
11 23	h m	°		11 23	h m	°	
12 1	5 44.1 6.0	+25 51	9 9°	12 1	5 53.2 6.1	+24 39	34 305°
9	5 38.1 7.1	+26 00	5 0.419	9	5 47.1 7.2	+25 13	32 0.488
17 14	5 31.0 7.5	+26 05	2 +1.3	17 16	5 39.9 7.8	+25 45	30 +37'
25	5 23.5 7.2	+26 07	2 9 <sup>m</sup> 2	25	5 32.1 7.8	+26 15	27
1 2	5 16.3 6.5	+26 05	3 0.215*	1 2	5 24.3 7.3	+26 42	23 0.320*
	5 09.8	+26 02	2*		5 17.0	+27 05	7*

## OPPOSITION EPHEMERIDES

1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
236 Honoria				344 Desiderata			
			11 <sup>m</sup> 2				13 <sup>m</sup> 0
12	1	5 50.0	7.1 +12 01 18	12	1	6 05.0	9.0 +38 37 36
	9	5 42.9	7.6 +11 43 10		9	5 56.0	9.6 +39 13 26
	17	5 35.3	7.4 +11 33 4		17	5 46.4	9.9 +39 39 16
	25	5 27.9	6.7 +11 29 5		25	5 36.5	9.3 +39 55 5
1	2	5 21.2	5.5 +11 34 10	1	2	5 27.2	8.4 +40 00 4
	10	5 15.7	+11 44 1		10	5 18.8	+39 56 1
			64°				151°
			0.425				0.525
			+6				+27
			11 <sup>m</sup> 7				7 <sup>m</sup> 4
			0.228*				0.379*
			1				1
225 Henrietta				1548 1935 FK			
			13 <sup>m</sup> 8				15 <sup>m</sup> 0
12	1	5 49.2	6.1 - 0 30 25	12	1	6 01.9	6.8 + 9 19 18
	9	5 43.1	5.9 - 0 55 16		9	5 55.1	7.4 + 9 37 26
	17	5 37.2	5.8 - 1 11 8		17	5 47.7	7.7 +10 03 33
	25	5 31.4	5.5 - 1 19 1		25	5 40.0	7.4 +10 36 40
1	2	5 25.9	4.9 - 1 18 10	1	2	5 32.6	6.6 +11 16 45
	10	5 21.0	- 1 08 2		10	5 26.0	+12 01 12
			126°				252°
			0.609				0.458
			-1.4				+4.0
			0.498*				0.280
			2				12
1408 Trusanda				801 Helwerthia			
			14 <sup>m</sup> 1				13 <sup>m</sup> 8
11	23	5 55.8	5.4 +13 20 25	12	1	6 02.9	6.5 + 2 02 37
12	1	5 50.4	6.4 +12 55 22		9	5 56.4	7.2 + 1 25 23
	9	5 44.0	6.8 +12 33 16		17	5 49.2	7.5 + 1 02 9
	17	5 37.2	6.8 +12 17 10		25	5 41.7	7.1 + 0 53 7
	25	5 30.4	6.2 +12 07 3	1	2	5 34.6	6.3 + 1 00 20
1	2	5 24.2	+12 04 1		10	5 28.3	+ 1 20 1
			49°				296°
			0.467				0.404
			-3				-6
			9 <sup>m</sup> 8				12 <sup>m</sup> 5
			0.292				0.203
			1				1
153 Hilda				10 Hygiea			
			13 <sup>m</sup> 4				10 <sup>m</sup> 0
12	1	5 50.7	5.1 +17 43 11	12	1	6 06.0	6.3 +25 17 4
	9	5 45.6	5.3 +17 32 10		9	5 59.7	6.9 +25 13 6
	17	5 40.3	5.4 +17 22 8		17	5 52.8	7.2 +25 07 9
	25	5 34.9	5.1 +17 14 6		25	5 45.6	6.9 +24 58 10
1	2	5 29.8	4.6 +17 08 5	1	2	5 38.7	6.1 +24 48 11
	10	5 25.2	+17 03 2		10	5 32.6	+24 37 2
			164°				244°
			0.660				0.532
			-1.0				-0.6
			0.555*				0.385*
			2				2
453 Tea				414 Liriope			
			12 <sup>m</sup> 8				13 <sup>m</sup> 0
12	1	6 01.1	9.3 +32 04 17	12	1	6 05.4	5.5 +17 15 12
	9	5 51.8	10.3 +32 21 9		9	5 59.9	6.3 +17 27 14
	17	5 41.5	10.6 +32 30 2		17	5 53.6	6.6 +17 41 17
	25	5 30.9	9.9 +32 28 11		25	5 47.0	6.3 +17 58 18
1	2	5 21.0	8.3 +32 17 19	1	2	5 40.7	5.6 +18 16 20
	10	5 12.7	+31 58 1		10	5 35.1	+18 36 2
			223°				12°
			0.375				0.514
			+23				+2.4
			16 <sup>m</sup> 3				0.360
			0.144				2
			1				1
235 Carolina				773 Irmintraud			
			12 <sup>m</sup> 5				12 <sup>m</sup> 9
12	1	5 59.5	7.2 +27 01 22	12	1	6 12.0	8.5 +43 52 3
	9	5 52.3	7.8 +27 23 18		9	6 03.5	9.5 +43 55 11
	17	5 44.5	8.1 +27 41 15		17	5 54.0	9.7 +43 44 23
	25	5 36.4	7.7 +27 56 10		25	5 44.3	9.1 +43 21 37
1	2	5 28.7	6.7 +28 06 7	1	2	5 35.2	7.9 +42 44 46
	10	5 22.0	+28 13 2		10	5 27.3	+41 58 1
			170°				149°
			0.484				0.486
			+2.5				-14
			0.317*				11 <sup>m</sup> 2
			2				0.326
			2				1

## OPPOSITION EPHEMERIDES

1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
660 Crescentia 11 <sup>m</sup> 2				841 Arabella 12 <sup>m</sup> 9			
12	1	6 08.4	6.7 + 1 41	12	1	6 24.9	7.3 +30 04
	9	6 01.7	6.7 + 1 28		9	6 17.6	7.3 +30 20
	17	5 54.2	7.5 + 1 28		17	6 08.5	9.1 +30 30
	25	5 46.6	7.6 + 1 40		25	5 58.6	9.9 +30 31
1	2	5 39.2	7.4 + 2 05	1	2	5 49.0	9.6 +30 23
	10	5 32.6	6.6 + 2 40		10	5 40.7	8.3 +30 07
			0.447				0.055
			+14'				1
			9 <sup>m</sup> 5				
			0.271*				
			1				
971 Alsatia 11 <sup>m</sup> 9				1068 Nofretete 13 <sup>m</sup> 2			
12	1	6 10.8	7.0 +22 30	12	1	6 23.0	6.6 +29 38
	9	6 03.8	8.4 +23 35		9	6 16.4	7.6 +29 42
	17	5 55.4	9.0 +24 43		17	6 08.8	8.0 +29 41
	25	5 46.4	8.5 +25 47		25	6 00.8	7.9 +29 35
1	2	5 37.9	7.4 +26 47	1	2	5 52.9	7.3 +29 25
	10	5 30.5	+27 40		10	5 45.6	+29 09
			0°				239°
			0.344				0.486
			+78'				-0.8
			19 <sup>m</sup> 6				0.320
			0.089				13
			1				
978 Aidamina 13 <sup>m</sup> 5				805 Hormuthia 13 <sup>m</sup> 8			
12	1	6 08.7	6.1 + 0 25	12	1	6 20.8	5.3 + 2 56
	9	6 02.6	6.6 - 0 22		9	6 15.5	6.0 + 2 43
	17	5 56.0	6.8 - 0 59		17	6 09.5	6.1 + 2 39
	25	5 49.2	6.3 - 1 24		25	6 03.4	6.1 + 2 43
1	2	5 42.9	5.7 - 1 35	1	2	5 57.3	5.7 + 2 56
	10	5 37.2	- 1 34		10	5 51.6	+ 3 16
			71°				140°
			0.496				0.561
			-22'				+1.0
			7 <sup>m</sup> 7				0.431
			0.345				3
			1				
1317 Silvretta 12 <sup>m</sup> 3				370 Modestia 12 <sup>m</sup> 8			
12	1	6 17.2	9.4 +54 31	12	1	6 27.1	8.0 +29 19
	9	6 07.8	11.2 +55 19		9	6 19.1	9.3 +29 04
	17	5 56.6	11.4 +55 45		17	6 09.8	9.9 +28 42
	25	5 45.2	10.6 +55 47		25	5 59.9	9.4 +28 14
1	2	5 34.6	8.8 +55 25	1	2	5 50.5	8.2 +27 40
	10	5 25.8	+54 43		10	5 42.3	+27 02
			30°				82°
			0.405				0.363
			+19'				-26'
			22 <sup>m</sup> 7				17 <sup>m</sup> 7
			0.219				0.124
			1				1
1209 Pumma 14 <sup>m</sup> 9				1103 Sequoia 13 <sup>m</sup> 3			
12	1	6 13.6	6.0 +22 40	12	1	6 34.7	10.0 +25 54
	9	6 07.6	6.7 +22 52		9	6 24.7	11.5 +24 22
	17	6 00.9	7.0 +23 03		17	6 13.2	12.1 +22 44
	25	5 53.9	6.8 +23 14		25	6 01.1	11.3 +21 02
1	2	5 47.1	6.3 +23 23	1	2	5 49.8	9.6 +19 23
	10	5 40.8	+23 32		10	5 40.2	+17 51
			188°				96°
			0.546				0.293
			+13'				-98'
			6 <sup>m</sup> 7				23 <sup>m</sup> 3
			0.404*				9.993
			1				1
767 Bondia 13 <sup>m</sup> 9				1453 Fennia 15 <sup>m</sup> 5			
12	1	6 18.8	6.4 +23 44	12	1	6 48.8	14.1 +64 19
	9	6 12.4	7.1 +23 52		9	6 34.7	19.7 +66 03
	17	6 05.3	7.4 +23 59		17	6 15.0	22.6 +67 10
	25	5 57.9	7.1 +24 04		25	5 52.4	21.8 +67 33
1	2	5 50.8	6.5 +24 08	1	2	5 30.6	17.4 +67 07
	10	5 44.3	+24 10		10	5 13.2	+66 01
			86°				190°
			0.501				0.290
			+6'				+0.2
			8 <sup>m</sup> 6				0.049
			0.341				12
			1				



1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
140 Siwa				492 Gismonda			
	h	m	°		h	m	°
12 1	6	26.8	+21 46	12 1	6	31.4	+24 47
9	6	20.2	+21 54	9	6	25.4	+24 55
17	6	12.8	+22 01	17	6	18.4	+25 02
25 <sup>24</sup>	6	05.0	+22 09	25 <sup>25</sup>	6	11.0	+25 07
1 2	5	57.2	+22 15	1 2	6	03.7	+25 10
10	5	50.1	+22 21	10	5	56.9	+25 10
			12 <sup>m</sup> 3				13 <sup>m</sup> 3
			136°				92°
			0.505				0.509
			+6'				+3'
			7 <sup>m</sup> 8				8 <sup>m</sup> 3
			0.346				0.352
			1*				1
1135 Colchis				12 Victoria			
	h	m	°		h	m	°
12 1	6	29.2	+30 14	12 1	6	35.0	+16 32
9	6	22.1	+30 27	9	6	27.7	+16 10
17	6	13.8	+30 33	17	6	19.4	+15 51
25 <sup>24</sup>	6	05.0	+30 34	25 <sup>25</sup>	6	10.6	+15 35
1 2	5	56.3	+30 28	1 2	6	01.8	+15 23
10	5	48.6	+30 16	10	5	53.8	+15 16
			13 <sup>m</sup> 7				10 <sup>m</sup> 6
			85°				134°
			0.427				0.438
			-0.5				-17'
			0.230				10 <sup>m</sup> 0
			5				0.246
							1*
1361 Leuschneria				1235 Schorria			
	h	m	°		h	m	°
12 1	6	26.9	- 5 33	12 1	7	12.1	+71 20
9	6	21.6	- 5 51	9	7	02.0	+73 46
17	6	15.4	- 5 57	17	6	41.4	+75 26
25 <sup>24</sup>	6	08.9	- 5 48	25 <sup>25</sup>	6	13.2	+76 10
1 2	6	02.6	- 5 26	1 2	5	44.9	+75 52
10	5	57.0	- 4 51	10	5	24.0	+74 41
			14 <sup>m</sup> 5				14 <sup>m</sup> 8
			102°				28°
			0.506				0.221
			+1.6				+156'
			0.365				103 <sup>m</sup> 7
			13				9.940
							1
261 Prymno				914 Palisana			
	h	m	°		h	m	°
12 9	6	27.2	+22 17	12 9	6	31.4	+13 15
17	6	19.1	+22 35	17	6	22.8	+12 17
25	6	10.1	+22 55	25	6	13.8	+11 24
25 <sup>25</sup>	6	01.0	+23 12	25 <sup>26</sup>	6	05.0	+10 38
1 2	5	52.5	+23 28	1 2	5	56.7	+10 00
10	5	45.6	+23 41	10	5	49.6	+ 9 29
18				18			
			11 <sup>m</sup> 3				13 <sup>m</sup> 1
			300°				139°
			0.350				0.461
			+19'				-54'
			18 <sup>m</sup> 2				8 <sup>m</sup> 1
			0.099				0.283
			1*				1
87 Sylvia				1366 Piccolo			
	h	m	°		h	m	°
12 9	6	25.3	+27 22	12 9	6	34.7	+35 28
17	6	18.9	+27 45	17	6	26.9	+35 50
25	6	12.1	+28 05	25	6	18.4	+36 05
25 <sup>25</sup>	6	05.2	+28 22	25 <sup>26</sup>	6	09.9	+36 11
1 2	5	58.6	+28 35	1 2	6	01.9	+36 08
10	5	52.8	+28 43	10	5	54.9	+35 58
18				18			
			12 <sup>m</sup> 1				13 <sup>m</sup> 7
			105°				139°
			0.552				0.505
			+2.2				+0.6
			0.420				0.349
			2*				13
1168 Brandia				1424 Sundmania			
	h	m	°		h	m	°
12 9	6	30.2	+ 7 54	12 9	6	37.0	+32 53
17	6	22.4	+ 7 25	17	6	30.0	+33 20
25	6	14.3	+ 7 05	25	6	22.3	+33 40
25 <sup>25</sup>	6	06.3	+ 6 55	25 <sup>27</sup>	6	14.5	+33 53
1 2	5	58.9	+ 6 55	1 2	6	07.1	+33 59
10	5	52.8	+ 7 05	10	6	00.6	+33 58
18				18			
			14 <sup>m</sup> 8				14 <sup>m</sup> 8
			88°				82°
			0.426				0.501
			-1.8				+0.8
			0.233				0.342
			13				12

## OPPOSITION EPHEMERIDES

1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.	1947-8	$\alpha_{1950}$	$\delta_{1950}$	Misc.
946 Poesia 13 <sup>m</sup> 0				58 Concordia 11 <sup>m</sup> 6			
12	9	h m		12	9	h m	
	17	6 37.8 6.3	+23 58 10 355°		17	6 53.5 6.3	+15 47 3 273°
	25	6 31.5 7.2	+24 08 9 0.427		25	6 47.2 7.2	+15 50 8 0.432
1	2 <sup>27</sup>	6 24.3 7.4	+24 17 8 -0.2	1	2 <sup>30</sup>	6 40.0 7.8	+15 58 12 -2'
	10	6 16.9 7.0	+24 25 6 11 <sup>m</sup> 5		10	6 32.2 7.6	+16 10 15 11 <sup>m</sup> 5
	18	6 09.9 6.5	+24 31 6 0.228		18	6 24.6 6.8	+16 25 18 0.238*
		6 03.4	+24 37 2			6 17.8	+16 43 1
820 Adriana 13 <sup>m</sup> 6				493 Griseldis 13 <sup>m</sup> 9			
12	9	h m		12	9	h m	
	17	6 40.8 6.1	+19 23 13 143°		17	6 58.1 8.0	+45 53 29 40°
	25	6 34.7 6.8	+19 36 14 0.513		25	6 50.1 9.3	+46 22 14 0.438
1	2 <sup>28</sup>	6 27.9 6.9	+19 50 15 +7'	1	2 <sup>30</sup>	6 40.8 9.7	+46 36 2 -13'
	10	6 21.0 6.8	+20 05 15 8 <sup>m</sup> 0		10	6 31.1 9.3	+46 34 19 16 <sup>m</sup> 0
	18	6 14.2 6.0	+20 20 16 0.357		18	6 21.8 8.0	+46 15 34 0.258
		6 08.2	+20 36 1			6 13.8	+45 41 1
628 Christine 12 <sup>m</sup> 5				322 Phaeo 12 <sup>m</sup> 0			
12	9	h m		12	9	h m	
	17	6 44.3 7.0	+16 39 31 138°		17	6 57.9 7.1	+18 31 19 65°
	25	6 37.3 7.9	+17 10 35 0.426		25	6 50.8 7.9	+18 12 16 0.424
1	2 <sup>28</sup>	6 29.4 8.3	+17 45 38 +27'	1	2 <sup>31</sup>	6 42.9 8.3	+17 56 13 -2.6
	10	6 21.1 7.9	+18 23 39 11 <sup>m</sup> 6		10	6 34.6 7.9	+17 43 11
	18	6 13.2 7.0	+19 02 39 0.227*		18	6 26.7 6.8	+17 32 9 0.224
		6 06.2	+19 41 1			6 19.9	+17 23 2
1476 1936 RA 15 <sup>m</sup> 9				1134 Kepler 17 <sup>m</sup> 5			
12	9	h m		12	9	h m	
	17	6 50.9 9.0	+31 34 9 120°		17	7 08.8 11.0	+45 16 36 67°
	25	6 41.9 10.0	+31 43 2 0.407		25	6 57.8 12.2	+45 52 19 0.435
1	2 <sup>28</sup>	6 31.9 10.3	+31 45 7 -1.2	1	2 <sup>31</sup>	6 45.6 12.3	+46 11 1 -15'
	10	6 21.6 9.6	+31 38 15 13 <sup>m</sup> 5		10	6 33.3 11.5	+46 12 18 13 <sup>m</sup> 5
	18	6 12.0 8.4	+31 23 22 0.198		18	6 21.8 10.0	+45 54 32 0.254
		6 03.6	+31 01 13			6 11.8	+45 22 1
209 Dido 11 <sup>m</sup> 8				120 Lachesis 11 <sup>m</sup> 8			
12	9	h m		12	9	h m	
	17	6 45.3 6.8	+33 10 16 210°		17	6 59.4 6.4	+31 55 14 255°
	25	6 38.5 7.5	+33 26 10 0.516		25	6 53.0 7.3	+32 09 8 0.501
1	2 <sup>29</sup>	6 31.0 7.8	+33 36 3 -4'	1	2 <sup>31</sup>	6 45.7 7.8	+32 17 3 -1.6
	10	6 23.2 7.5	+33 39 4 8 <sup>m</sup> 8		10	6 37.9 7.8	+32 20 4
	18	6 15.7 6.8	+33 35 9 0.364*		18	6 30.1 7.0	+32 16 11 0.342*
		6 08.9	+33 26 1			6 23.1	+32 05 2
459 Signe 12 <sup>m</sup> 6							
12	9	h m					
	17	6 49.4 8.0	+38 34 51 32°				
	25	6 41.4 9.4	+39 25 37 0.339				
1	2 <sup>29</sup>	6 32.0 9.8	+40 02 19 +16'				
	10	6 22.2 9.1	+40 21 2 24 <sup>m</sup> 4				
	18	6 13.1 7.4	+40 23 14 0.087*				
		6 05.7	+40 09 1				

1	m	'	42	m	'	79	m	'	122	m	'
	-0.1	0 13		0.0	-1 2		0.0	+1 2		+5.7	+28 2
	+2.2	+17 14		+0.1	+2 4		+0.1	-6 14		+6.1	+30 14
	-0.4	-1 15		0.0	0 14	80	+0.9	-5 2	123	0.0	+1 2
2	+0.6	-1 13	44	+0.7	-3 13		0.0	-1 5		-5.3	-28 14
	-0.3	+3 14		-1.6	+8 14		-0.3	+1 14	124	+1.0	-1 2
	-1.1	+2 15	45	-0.2	-5 2	84	-0.1	0 2		0.0	0 11
3	-1.0	-3 2		-0.3	-2 14		-0.1	0 9		+1.6	-5 14
	-0.4	0 14	49	0.0	0 2		+0.2	-10 14	125	+3.9	-6 14
	-1.0	-3 15		0.0	0 14	85	-1.9	-20 2	126	0.0	0 2
5	+5.0	+6 2	50	-0.9	0 2		-3.2	-24 14		0.0	0 14
	-6.1	+8 14		-1.0	0 14	86	+1.1	+6 2	127	0.0	0 14
7	-0.4	-1 13	51	+1.0	-3 2		+1.1	+6 14	128	0.0	0 2
	-7.5	-23 14		+2.1	+14 14	87	-11.2	-26 14		-0.1	0 5
	-6.6	-20 15	52	0.0	0 2	88	0.0	0 2		0.0	0 14
8	0.0	0 2		0.0	0 14		0.0	0 8	129	+21.3	-24 13
	0.0	0 5	53	-1.7	+15 2		0.0	0 14		-0.2	+1 14
	+0.8	-6 14		+0.1	0 11	89	0.0	0 2	130	-0.9	+2 2
9	0.0	0 13		-3.9	+27 14		0.0	0 14		+0.1	-1 14
	-0.1	0 14	54	-0.1	+1 2	90	0.0	0 2	132	-1.2	-22 2
10	+4.9	-2 14		+3.2	+10 14		0.0	0 5	133	-0.1	0 2
11	-64.2	-361 13	55	0.0	0 2		-10.0	+33 14		-9.4	+35 14
	0.0	-1 14		-1.3	+5 9	91	-0.8	+2 2	134	0.0	-1 2
12	+5.3	-11 2		-0.1	0 14		-6.9	+40 8		0.0	0 14
	+0.4	-2 14	57	0.0	-1 14		-1.8	+8 14	135	+2.2	+12 13
	-1.6	+1 15		-0.4	-1 15	92	-0.1	+1 2		+1.9	+9 14
13	+0.1	0 2	58	+1.9	+1 2		-0.1	0 14	136	0.0	+2 2
	0.0	0 8		+1.2	-1 14	93	0.0	-1 2		-0.2	0 14
	0.0	0 14	59	0.0	0 2		0.0	-1 8	137	0.0	-1 2
14	+4.8	-18 2		-0.1	+1 11		+5.0	-8 14		+8.5	+24 14
	+5.6	-20 14		+1.9	+3 14	95	+3.6	+17 14	138	-14.8	-16 2
16	-2.1	+11 2	60	0.0	+8 2	97	0.0	-1 2		-16.9	-17 14
	0.0	0 5		-5.7	+27 14		-0.1	0 8	139	0.0	0 2
	-0.3	+1 14	61	0.0	0 2		0.0	-1 14		-8.1	-24 14
17	0.0	0 2		-3.4	-2 14	98	-0.1	-1 2	140	-0.1	0 2
	-10.4	-34 14	62	+5.2	-9 14		-0.1	-1 8		0.0	0 14
19	-1.3	0 2	63	-0.2	0 13		-0.1	-1 14	141	-7.1	-38 2
	-17.3	-14 14		-5.0	-8 14	99	0.0	0 14		+0.3	+3 14
21	+0.1	0 2	64	+0.7	+2 2	100	0.0	+1 14	142	0.0	0 2
	+2.5	+12 14		+0.2	0 14	101	+0.4	+3 2		0.0	0 5
23	-8.9	+9 14	65	-9.7	-16 14		-0.3	+12 14		0.0	0 14
24	0.0	0 2	66	-0.1	-1 8	103	0.0	0 2	144	+1.2	-4 2
	-0.1	0 8		+1.7	-18 14		0.0	-6 14		+0.1	-1 8
	-4.4	+17 14	67	-0.9	+9 2	104	-11.3	-15 14		-2.5	+13 14
25	0.0	0 14		0.0	+1 5	105	0.0	0 5	146	-0.3	0 2
28	+0.1	-1 2		-0.7	+11 14		+1.8	+3 14		0.0	0 14
	0.0	0 5	70	+0.7	+14 2	106	0.0	0 2	147	-0.1	+1 14
	+2.6	-11 14		+1.5	+18 14		0.0	0 14	148	-4.4	+10 2
30	0.0	0 9	71	0.0	0 2	108	+1.2	+3 14		0.0	-12 4
	+3.9	-18 14		+17.6	-85 11	109	+0.3	-1 14		-4.5	+10 14
31	0.0	0 2		-2.4	+6 14	110	-0.5	+3 14	150	0.0	-1 2
	0.0	+2 14	72	-0.1	-1 2	115	0.0	0 2		0.0	-1 14
34	-1.9	+10 2		-0.8	-1 14		0.0	0 5	152	0.0	0 2
	0.0	-1 8	73	-0.4	-2 2		-0.7	+10 14		0.0	-1 14
	-1.7	+10 14		-0.7	-1 14	116	-0.1	0 14	153	+2.6	-3 14
37	+1.9	-12 2	75	0.0	0 11	117	+0.9	-6 14	154	+2.3	-6 14
	0.0	0 9		-0.6	0 14	119	0.0	0 2	156	+0.1	-5 2
	+0.8	-6 14	76	0.0	0 14		-5.1	+15 14		+1.7	+4 14
38	0.0	+1 2	77	+0.9	-9 2	120	-0.1	0 14	157	0.0	-3 4
	0.0	+1 8		0.0	0 8	121	+4.2	-19 14		-8.7	+70 14
	+1.6	-12 14		+1.1	-10 14				158	+11.6	+66 14

## Appendix

161	m	'	198	m	'	238	m	'	298	m	'
-0.4	-2	2	-4.4	+20	2	-2.0	-8	14	0.0	0	10
+0.1	+1	14	+0.2	0	9	+2.6	-12	2	0.0	0	2
162	+0.2	0	199	-0.1	+1	-0.1	0	9	300	0.0	0
+0.3	0	14	0.0	+1	14	-6.2	+32	14	304	0.0	0
163	+0.1	0	200	0.0	+1	0.0	0	2	306	+0.2	+1
+3.8	+13	14	+0.4	+3	14	-0.6	-1	14	0.0	0	14
164	+3.7	-20	201	0.0	0	242	-1.0	+2	309	0.0	+5
165	+0.1	0	-2.6	+4	14	243	+8.7	+42	310	0.0	0
+0.8	-3	14	202	0.0	0	244	+0.1	0	315	-0.1	0
166	-3.8	-20	0.0	+1	14	+0.1	0	14	317	-0.4	-2
168	+1.3	-5	203	-2.3	-13	245	+0.3	0	324	+19.8	+169
169	0.0	0	+0.7	+5	14	246	-0.6	+17	+19.7	+169	13
0.0	0	8	204	-0.7	+9	0.0	-1	8	325	0.0	-1
0.0	0	14	+0.4	-1	8	+1.0	-3	14	328	-0.1	+1
170	-6.0	+34	-10.5	+46	14	248	+0.3	0	329	+21.4	-14
-0.1	+2	8	205	0.0	0	+9.1	-31	14	331	+0.1	0
-3.4	+22	14	0.0	-1	14	249	0.0	0	332	-0.1	-2
171	+0.2	+1	206	-1.3	-10	+2.5	+3	14	-0.1	-1	3
+0.1	0	14	-0.5	-3	14	250	+7.5	+68	333	0.0	0
172	+0.1	-1	207	+0.3	-2	252	-1.8	+4	334	+1.5	+6
+0.1	+9	8	-3.2	+12	8	253	0.0	0	335	-0.3	-1
+1.2	-12	14	-18.7	+71	14	259	+0.1	0	337	0.0	+6
173	+2.1	+2	208	-2.2	-11	-7.3	+43	14	-0.1	0	14
-0.1	0	14	-3.4	-17	14	260	+3.8	-15	338	0.0	-1
175	+0.3	+1	209	0.0	0	261	+0.1	-1	339	0.0	0
-6.2	-40	14	0.0	0	14	0.0	-1	14	340	-2.3	-5
176	-0.1	0	211	0.0	0	263	0.0	+1	342	0.0	+1
0.0	-1	14	-0.4	-4	14	0.0	+1	3	344	0.0	0
179	0.0	0	212	+0.4	-5	264	+9.2	+65	345	-0.5	+8
+1.0	-1	14	214	+0.6	+1	265	-0.1	-1	-0.1	-1	4
180	0.0	+1	216	+5.7	+21	267	0.0	0	-0.1	0	14
181	0.0	-1	-1.6	-8	15	268	-39.9	+41	346	+1.7	+4
-0.7	-1	14	217	0.0	0	-50.1	+57	14	347	-1.9	+3
182	0.0	0	219	0.0	0	269	-0.3	-2	348	0.0	0
-2.4	-1	14	-0.1	0	8	271	+2.5	-29	349	+3.5	+6
184	+0.1	+1	-0.1	-2	14	0.0	+1	14	350	0.0	0
-9.9	+44	14	221	+12.6	+41	273	0.0	0	351	+0.1	+2
185	+1.7	-3	223	+0.1	0	0.0	0	8	352	-1.2	-5
+0.5	-4	15	+24.8	-140	14	278	+8.4	-62	354	-1.6	-4
186	+0.1	0	224	-0.2	-1	280	-33.1	+52	-2.4	-5	14
+0.1	0	4	+0.9	-3	14	282	0.0	-1	355	-16.1	-19
+0.1	0	14	225	-8.1	+12	-0.1	0	8	358	+0.1	+1
187	+0.5	+4	226	+0.2	+1	-33.8	-5	14	0.0	0	10
188	0.0	0	227	+0.1	-1	283	0.0	0	359	0.0	+1
+2.9	+6	14	0.0	0	14	0.0	0	4	362	-1.3	+2
189	-0.5	-7	228	-1.7	+6	284	0.0	+1	0.0	0	10
+0.2	+2	14	230	0.0	0	286	+0.1	0	-0.3	+2	14
190	+7.0	+23	-0.1	0	14	287	+1.1	+5	364	-0.1	-2
191	-0.1	0	231	0.0	0	-3.4	-13	14	365	-0.1	0
192	0.0	+1	+0.1	0	14	-0.4	-2	15	368	0.0	0
-0.1	+1	14	233	+1.0	-5	288	0.0	0	372	0.0	0
193	-3.6	+15	-0.1	-2	8	-0.8	-5	14	375	+31.7	-77
194	+2.2	+7	-3.8	+16	14	290	+11.1	-32	+31.7	-78	14
-1.5	+2	14	235	-0.1	-1	0.0	0	14	376	+0.6	-4
195	-4.6	+38	236	+0.4	0	291	-0.1	0	-0.1	0	4
196	+0.1	-1	-4.2	-2	14	292	-6.4	-20	379	-0.1	0
+0.8	-1	14	237	0.0	0	293	+0.1	0	380	0.0	0
197	0.0	0	0.0	0	5	0.0	0	3	381	-0.1	0
-3.7	+20	14	+0.1	0	8	294	0.0	0	382	+0.1	-1
			0.0	0	14	297	-0.1	0	384	+0.3	-5
									385	+17.9	-180

388	m	0	2	518	m	0	2	690	m	0	2	865	m	-1	9
389	0.0	-1	2	520	0.0	+2	4	693	-0.9	-4	14	866	0.0	0	2
391	-4.5	-14	2	524	-1.0	+9	4	695	-0.1	0	3	869	-0.1	0	9
393	0.0	0	2	532	-0.9	-4	14	703	+0.1	-2	9	871	0.0	0	4
	0.0	0	3		-0.5	-3	15	704	0.0	0	9	876	+7.8	-28	8
395	-0.1	+1	2	535	+0.3	+1	2	705	+7.7	+64	14	885	0.0	0	9
	-0.1	+1	8	537	0.0	+1	2		0.0	0	2	886	0.0	0	3
398	0.0	-1	2	540	+0.1	-1	2	707	0.0	+1	4	887	+4.0	-13	4
400	0.0	0	12	548	0.0	0	9	709	0.0	0	2	901	-0.1	0	4
403	-0.8	+9	2	550	-0.1	+1	9	712	+0.1	-2	2	902	0.0	0	9
406	-1.1	+4	9	551	-59.8	+395	4	714	-3.1	+21	2	903	+4.9	+14	2
409	0.0	+1	2	552	0.0	0	2		0.0	+1	9	905	0.0	0	2
	+0.1	+1	4	554	0.0	0	2	715	+0.1	-1	9	906	0.0	0	2
	-1.3	+2	14	557	-0.1	-1	9	718	0.0	0	2	908	0.0	0	9
	0.0	+2	15	563	-4.3	-23	2	727	0.0	+1	2	909	+1.2	-3	14
410	0.0	0	2		+3.7	+23	14		-0.4	+3	14	915	-0.2	0	3
419	-2.1	+10	2	565	-1.8	0	4	731	0.0	0	3	917	0.0	0	4
423	-2.4	+16	14	579	-0.8	-6	14	737	+0.1	0	3	920	0.0	-1	9
425	+3.7	-24	2	580	+0.1	0	3	742	+0.3	+2	2	924	0.0	+3	4
	+3.7	-24	4	581	0.0	0	3	744	-0.1	0	3	925	-0.1	0	8
426	+0.2	0	3	583	-0.2	+1	3	747	0.0	+1	2	927	0.0	-2	9
429	0.0	+1	2	584	-0.1	+2	4	749	0.0	0	4	929	+0.2	-2	4
432	0.0	0	2	595	0.0	0	2	750	+0.1	0	4	945	0.0	0	4
433	-0.3	-1	14	602	0.0	+1	2		+0.1	0	9	949	+0.4	-3	8
	-0.2	0	15		+0.4	+7	14	751	0.0	+1	2	950	+0.1	0	4
434	-0.1	-4	2	603	+0.1	-1	8	752	-0.1	0	9	960	0.0	0	4
442	0.0	0	2	605	-0.1	+1	9	755	0.0	0	3	963	-0.1	-2	14
443	+0.3	0	2	608	+2.3	+3	2	757	0.0	0	3	976	0.0	0	3
444	-0.3	+1	14	609	+0.1	0	9	760	+64.2	+579	14	977	0.0	0	3
445	0.0	+1	8	611	+0.2	+1	2	762	-0.1	0	2	981	0.0	+1	9
454	-0.5	-6	2	615	+2.7	-23	2	766	0.0	0	3	987	0.0	0	8
	0.0	-1	10		+2.1	-15	4	772	-0.1	+1	2	991	+0.1	0	9
455	-1.0	+8	14	622	+0.3	+3	2	774	-0.1	0	3	994	0.0	0	9
456	0.0	0	2	625	0.0	0	2	777	+0.2	+1	9	995	0.0	0	9
458	0.0	0	2	628	+0.9	+13	2	779	-0.2	-10	2	999	+0.1	0	8
459	0.0	+4	9	635	-2.4	-6	2	780	0.0	0	3	1007	+0.2	-1	9
460	-7.2	+35	8	636	+0.1	0	9	783	+0.1	0	2	1011	+0.1	0	9
467	0.0	0	8	639	0.0	-1	9	784	+0.1	-1	2	1015	0.0	+1	9
469	0.0	+1	2	644	-1.0	+6	4	785	+17.7	-115	2	1020	-0.1	0	5
474	-1.0	+3	4	647	+0.1	-1	9		0.0	0	3	1021	-1.4	+8	11
476	-0.2	0	4	648	0.0	+2	2	786	0.0	0	3	1034	+0.1	0	4
478	-0.1	0	2	654	+0.8	+11	2	787	0.0	+1	2	1042	-0.1	0	9
	0.0	0	14		+0.1	+1	9	788	0.0	0	2	1054	-0.1	+1	5
480	+0.3	-15	2		-1.3	-3	14	798	-0.1	0	3	1057	0.0	0	4
	-1.9	-3	9	658	-0.1	0	3	803	-1.5	-1	1	1058	+0.1	0	4
485	0.0	-1	2	660	-4.2	-5	2	813	-0.3	+1	3	1066	0.0	-1	5
	+0.1	-1	8		-2.4	-4	14	815	0.0	+1	3	1076	-0.1	0	9
488	+0.1	0	2	665	-0.1	+1	2	822	-0.1	0	3	1085	0.0	0	5
494	0.0	0	2	672	0.0	0	11	826	-0.1	+1	3	1086	0.0	+1	5
495	+0.1	0	8	674	0.0	0	2	828	0.0	0	3	1090	-0.2	+1	14
498	+2.0	+3	2		-2.8	-7	14	829	+0.1	0	9	1091	0.0	0	5
	0.0	-1	3	675	0.0	+1	2	832	+0.1	0	9	1094	+0.1	0	4
	0.0	-1	14		+0.1	-1	9	835	-0.5	+156	3	1095	0.0	0	9
500	+0.6	+10	2	676	-0.8	0	14	836	+0.1	+1	9	1096	0.0	0	9
505	-13.6	-44	2	678	+0.5	-3	11	840	+0.1	-1	8	1104	0.0	0	5
511	0.0	-1	2	679	+3.8	-8	2	844	-0.1	0	3	1108	-6.6	+36	4
	+2.9	-17	14		0.0	0	4	849	0.0	0	2	1110	0.0	0	4
513	+0.1	0	6	680	0.0	0	3	850	+0.1	0	9	1112	0.0	0	9
516	-0.1	-1	2	687	-0.8	+9	9	861	0.0	0	2	1117	-0.1	+1	4
	-0.8	-7	14	688	-0.1	+1	9					1118	+0.1	-1	9

## Appendix

	m	'		m	'		m	'		m	'					
1126	0.0	0	5	1266	-16.2	+112	14		1380	-1.2	+13	3	1469	+0.1	0	8
1129	-0.1	+1	14	1273	+4.2	+26	5		1383	0.0	0	14	1479	0.0	0	8
1136	0.0	+1	9	1275	0.0	+1	10		1385	-0.1	0	5	1482	-0.1	0	8
1139	+0.2	-1	9	1278	+0.1	+1	9		1389	-0.1	+3	10	1483	0.0	-1	10
	+1.5	-1	14	1279	0.0	0	9		1390	0.0	-1	2	1484	0.0	0	5
1142	0.0	0	5	1280	+0.3	+1	13		1393	+62.5	-435	5	1485	+8.5	-58	1
1149	+0.1	+1	9	1282	+0.1	-1	10			+62.4	-434	9	1490	+20.5	+91	5
1155	+0.1	0	11	1283	+0.9	+2	14		1394	+0.1	-1	9		+17.9	+64	15
1177	0.0	0	3	1296	0.0	0	3		1400	0.0	0	3	1496	+0.1	-1	9
1178	+1.0	+1	14	1303	-5.4	-25	14		1406	+2.1	-10	10	1504	+1.8	-5	9
1185	0.0	+1	14	1304	+0.1	-1	14		1407	0.0	0	4	1505	+0.1	+1	5
1196	0.0	0	5	1305	+0.6	-1	3		1417	+2.2	-12	1	1506	0.0	+1	11
1202	+2.1	+10	2		+2.3	-4	14		1420	-0.1	0	10	1509	-0.6	+3	7
1209	+0.1	0	9	1307	+8.2	+26	14		1421	0.0	0	11		+0.1	-1	9
1213	-0.1	0	3	1310	+0.1	0	9		1432	0.0	0	9	1511	0.0	0	3
1215	-0.1	-1	3	1312	0.0	0	5		1434	-9.0	+25	14	1512	-0.1	0	12
1225	0.0	-1	9	1326	0.0	0	5		1435	-2.9	+3	15	1513	-0.1	+1	9
1228	0.0	0	8	1331	0.0	0	10		1436	0.0	0	2	1515	+0.1	-1	9
1232	+1.4	+8	14		0.0	0	14		1438	-0.5	+2	14	1516	0.0	0	9
1233	0.0	0	5	1334	0.0	-2	10		1440	+6.8	-2	1	1517	-4.8	+35	14
1237	-0.1	-1	3	1338	0.0	0	3		1441	-0.1	0	9	1522	+0.1	-2	11
1240	0.0	0	9	1346	0.0	+1	14		1450	0.0	0	9	1523	0.0	0	9
1243	0.0	+1	9	1347	-1.5	-5	14		1454	0.0	0	9	1524	0.0	0	10
1245	-1.1	+1	14	1350	-1.3	+4	14		1455	+0.1	0	9	1529	-0.1	0	12
1246	+0.1	0	9	1362	-65.6	-39	2		1459	+0.1	+1	9	1530	0.0	0	5
1247	0.0	0	9	1365	0.0	0	14		1460	0.0	0	5	1531	-0.8	0	7
1249	0.0	-2	8	1371	0.0	+1	2		1461	0.0	-1	2	1535	0.0	0	3
1251	0.0	+1	9	1373	-6.8	-149	1			0.0	0	9	1544	0.0	0	5
1260	-54.4	-121	5		-1.6	-34	2		1464	-0.2	+1	7	1549	0.0	0	11
1264	0.0	0	5	1377	0.0	0	3		1468	+0.1	0	9	1554	0.0	0	11



